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3DArtist

09

Practical inspiration for the 3D community

41 Pages of expert creative guides

Maya Use Ray Trace Shadows to create transparency

Poser Construct, pose and render a dungeon warrior

3ds Max Create a cheeky, pint-sized superhero

Vue How to use materials to create wet-looking stones

• Feature

DR WHO SPECIAL FX

How the new series' effects were made

• Step-by-step Maya tutorial

Build a classic car

Learn NURBS modelling techniques

• Your questions answered

Master Face Room

Importing headshot photos into Poser

Plus: Prime Focus VFX – cinema effects, The Neighbourhood – not just an agency

Reviews: ZBrush 3.5, SketchBook Mobile Scooby-Doo! The Mystery Begins

inside

• Latest review

PIXOLOGIC ZBRUSH 3.5

All the new features revealed

• Studio Access

HYDROPHOBIA

Dark Energy explains all about real-time water animation

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How to use the modo 401 fur engine to paint textures on your models

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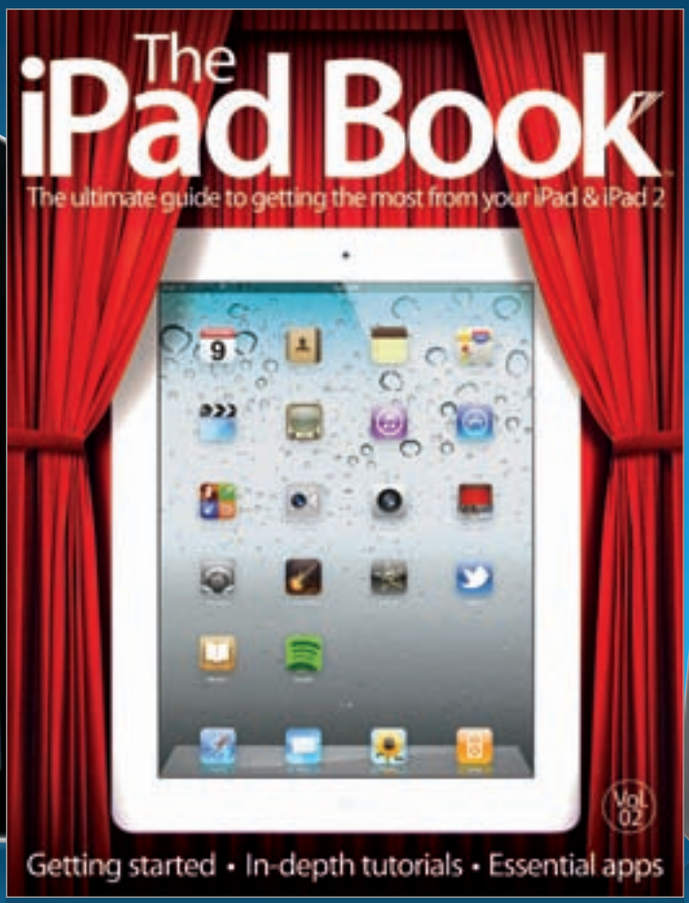
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Artist info

Marcos de Moraes Sampaio

Personal portfolio site
www.msampaio.com

Country Brazil

Software used Photoshop and modo

Cover artist

Everyone's talking about the new fur capabilities of modo 401, but Marcos has gone out and shown what can be achieved with it. Fantastic composition and, of course, fur.

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Welcome

to the magazine and 116 pages of amazing 3D

Every issue you can count on...

1. **116 pages of creative inspiration**
2. Behind-the-scenes guides to images and artwork
3. **A CD packed full of creative goodness**
4. Interviews with inspirational artists
5. **Tips for studying 3D or getting work in the industry**
6. The chance to see your art in the mag!

If you spent part of your childhood hiding behind the sofa when the Cybermen arrived or marvelled at sentient lumps of rock, then you spent your formative years watching *Dr Who*. The threadbare sets and questionable effects of the show – not to mention increasingly poor actors – eventually saw its demise. However, thanks to the marvel of CGI, the falling cost of hardware and the increasing sophistication of software, the decision was made to relaunch the series in 2005. We chart that return in this issue and talk to The Mill, which had the challenge of producing the VFX, on TV budgets, to make it come alive.

Duncan Evans, Editor

This issue's team of expert artists...

Marcos Sampaio

Fur is all the rage and Marcos has put the new features of modo 401 to full effect in his splendid *Polar Bear* tutorial

Nicolas Garilhe

Want to know how to model a cheeky, pint-sized superhero? Nicolas has the information you need in his tutorial

Paul Francis

A new addition to the Q&A panel charged with fulfilling your Poser needs, Paul also has a dungeon-tastic tutorial for you

Lance Hitchings

Lance runs a design studio stateside, and is also the chap manning the Q&A helpdesk for your Maya problems

Dominic Davison

If there's anyone better at creating superrealistic landscapes using Vue, we would like to know!

Daniel Lovas

If you have a question about CINEMA 4D and don't know who else to ask, then ask Daniel because he'll know the answer

April Madden

April is deputy editor on **Digital Artist** magazine and a graphic artist. We make her review all kinds of books

Andrei Kashkin

A rain-pelted road in the American countryside, an old diner, a driver pulled up for a break. Check out the atmosphere

Rosie Tanner

If you see a blonde-haired woman lurking outside your uni, it's our Rosie getting the lowdown on the latest CG courses

Sarah Slee

Dancing through the 3D garden, picking all your community stories, is pixie-like Sarah and her army of gnome helpers

John Hayes

John works as a character artist for Sega so he knows all there is to know about games character creation

Christian Darkin

Christian has been getting to grips with the exciting new features of ZBrush 3.5 this issue. Sculpt like it's 1999, Christian!

Sign up, share your art and chat to other artists at www.3dartistonline.com

3DArtist

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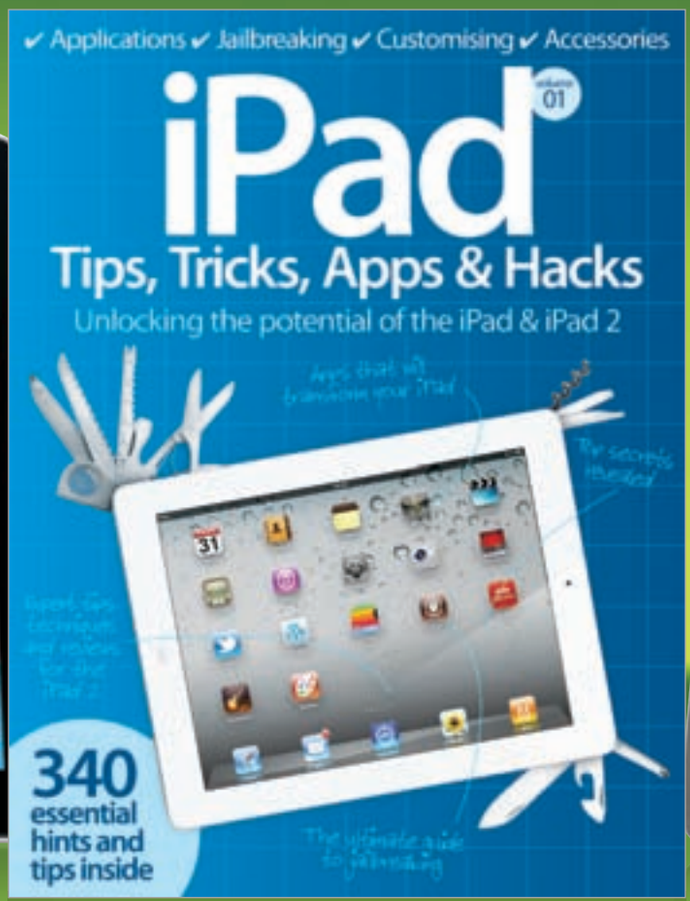

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INSIDE ISSUE NINE

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Discover how these images were created...

Create realistic wet and dry fur

"The sculpting tools used the most for this project are the Push, Smooth and Move tools"

Six-page step-by-step walkthrough guide

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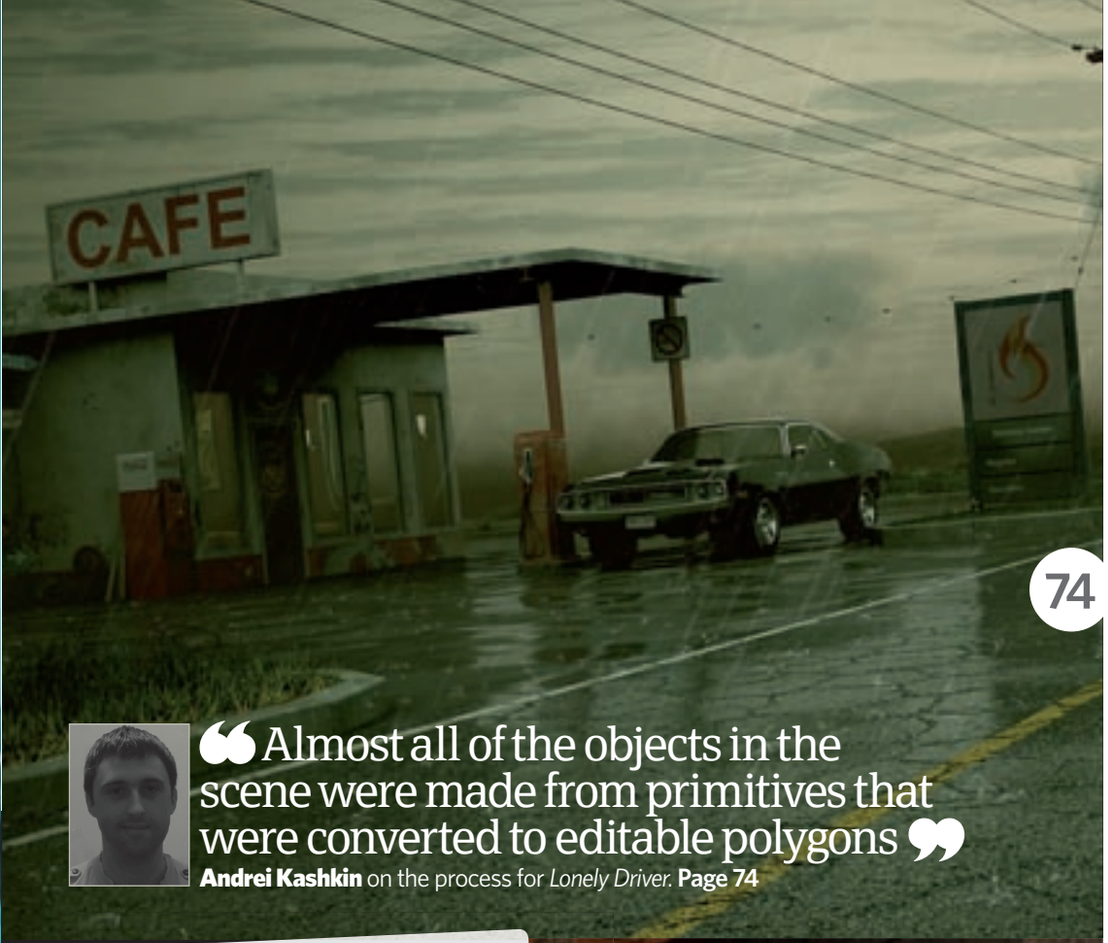

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“Almost all of the objects in the scene were made from primitives that were converted to editable polygons”

Andrei Kashkin on the process for *Lonely Driver*. **Page 74**

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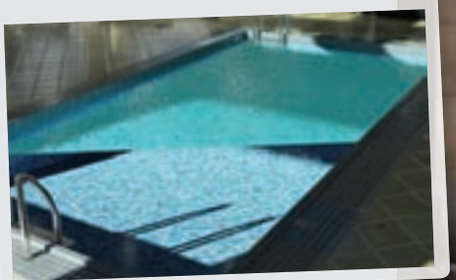

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How to create a proto-superhero in the form of a cheeky, streetwise little youngster

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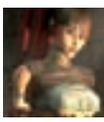
It's time to show the Poser fans some love with this fantastic tutorial down in the dungeon



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Check out the rainy and windswept vista of mid-America solitude

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There's even more inside...

Turn the page to discover the interviews, reviews, industry advice and more that we've packed into this issue...

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"If you don't fall in love with the Doctor and the companion, it doesn't matter how good the effects are"

Will Cohen on the strengths of the new *Dr Who* series. **Page 34**

workspace 3D

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It's a jungle out there. Swing through it

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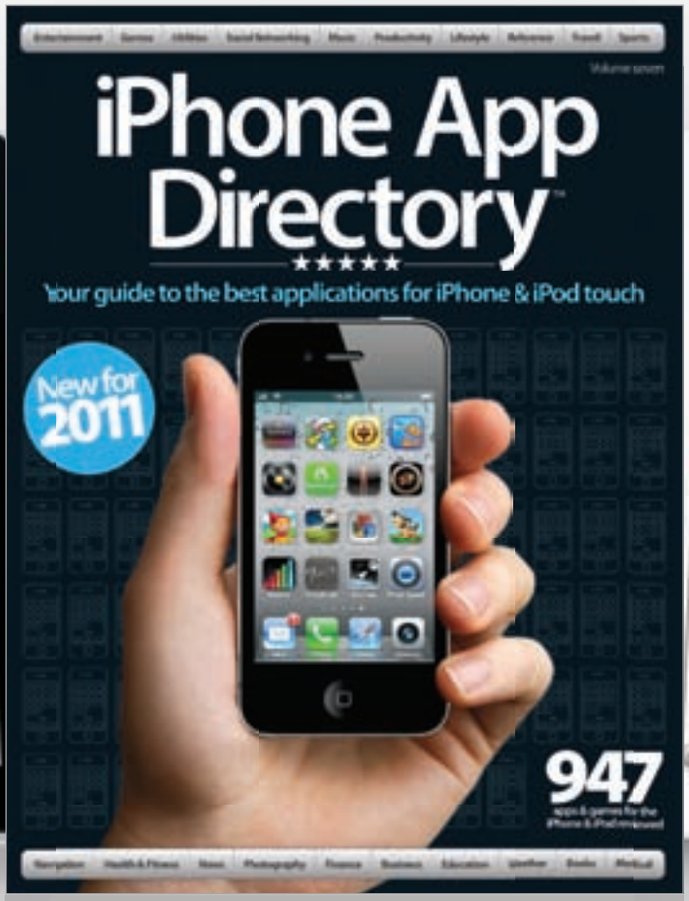

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WELCOME TO THE GALLERY

Nine pages of great artwork from the 3D community

Images we love!

> I created this image because I wanted to test a V-Ray render engine and because I saw a picture like this somewhere, and I remembered that I was impressed with the mood and the atmosphere

Bertolotti Simone
Sweet-N, 2009

Artist info

Bertolotti Simone

Personal portfolio site www.imonfox.it
Country Italy
Software used CINEMA 4D, V-Ray and Photoshop

Featured artists

Bertolotti Simone A highly detailed bedroom scene with a great use of lighting

Giorgia Baldissera Water mess this bathroom is in! A great 3D tribute to a CGI film

Sami Mustonen A vintage gun and paraphernalia lends itself to a scene full of detail

Dennis Mejillones This menacing demon warrior got up on the wrong side of bed!

Khurram Hamid Alavi A personal interpretation of the *G.I. Joe* villain Zartan

Anders Lejczak Wonderful WW2 aviation artwork from this Swedish digital artist

Jian Xu Realistic and intricate portrait brings some class to these pages

Roger Harris One furry friend you wouldn't want as a pet. Admire from a distance

Get your artwork featured in these pages

Simply send it to the **3D Artist** Gallery. Here's how...

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2. Upload your images

Once registered, you can upload images to your gallery – there's no limits on numbers but check the size criteria.

3. Tell us about them!

Have an image you feel passionate about? Drop editorial an email at **duncan.evans@imagine-publishing.co.uk**.

Email or post

You'll be missing out on a thriving 3D community, but if you'd rather submit your work by email or post, here's how. Make sure your image is at least 3,000 pixels on the longest side, save it as a maximum quality JPEG or zip it up as a TIFF and email it to the address below. Please include your contact details! If you've created a Pixar-beating animation and want to see that featured on the cover CD, then save it onto a CD and post it to us. You can also send your images on CD. The addresses are:

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Comment on more great 3D art...

Head straight over to **www.3dartistonline.com**, register and you can leave comments for other artists. Some of the people featured here already have their galleries, so get online and join our club!

Create your gallery today: www.3dartistonline.com

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“Before setting up the scene, I first created the creature inspired by the film *The Water Horse*, then I tried to give context to the character, modelling a dirty bathroom with various details. Each object has been modelled with 3ds Max. I used my digital camera and Photoshop to make several kinds of maps. The scene was rendered with the mental ray engine, adding GI”

Giorgia Baldissera *The Mischievous Waterhorse*, 2009

Artist info

Giorgia Baldissera

Personal portfolio site http://giorgiabaldissera.cgsociety.org/gallery/

Country Italy

Software used 3ds max, mental ray, Photoshop, ZBrush

Work in progress...

The team Loves

“I like the messiness in the room – a real bathroom should have stuff strewn all over the place. Or maybe that's just me!”

Jo Editor in Chief

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"The history of mankind and invention has always interested me. Initially, I built only the flintlock but then realised I couldn't stop there and soon I had created an outlaw's possessions spread around the flintlock. Creating a dirty, worn-out look is always fun. Modelled in 3ds Max, rendered with V-Ray, while textures and colour correction were made in Photoshop"

Sami Mustonen *Flintlock*, 2009

Artist info

Sami Mustonen

Personal portfolio site
www.samimustonen.com

Software used 3ds Max, Photoshop

Work in progress...

The team Loves

"Not only is this full of great detail, but the textures are fantastic as well. Throw in the lovely colouring and you have a first-rate image"

Duncan Editor

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The team loves

Scary and ghastly, yet also freakishly good. The modelling is excellent and there's a real sense of menace and horror in the figure itself. The chaotic background adds to it

Duncan Editor

My goal in creating this image was to create something that looked like it came right out of a Blizzard cinematic scene. At the same time I wanted a character that would look brutal and had a good range of surfaces that I could experiment with. I am a big fan of Blizzard Entertainment's art and was inspired by its concept paintings as well as its cinematic work

Dennis Mejillones *Undead Warrior's Wrath*, 2009

Artist info

Dennis Mejillones

Personal portfolio site www.pixelrapture.com

Country USA

Software used ZBrush, 3ds Max 2009, Photoshop, rendered in mental ray

Work in progress...

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The team Loves

A sinister stare and well-thought-out pose adds to the overall ambience in this image, not to mention the limited colour palette that speaks volumes!

Jo Editor in Chief

This model was made for a modelling challenge over at CGHub.com. I've always loved this character but I've never seen a modern interpretation of him based on the old-school version from the Eighties. This is my tribute to this great villain!

Khurram Hamid Alavi *Zartan*, 2009

Artist info

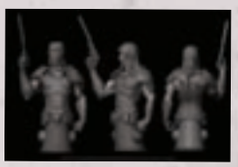
Khurram Hamid Alavi

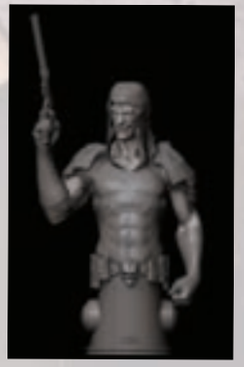
Personal portfolio site http://leviathon.cgsociety.org/gallery/

Country Pakistan

Software used ZBrush, Photoshop

Work in progress...





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I've been building models and drawing since I was a little kid but have replaced plastic kits and paper with polygons and rendering engines. This render shows a German Messerschmitt flown by a pilot named Hans Ohly during WWII. Modelled and rendered with modo. It was a personal project created just for fun. The mesh and textures can be downloaded from my site

Anders Lejczak *Messerschmitt Me109,* 2009

The team Loves

Wonderful detail, from the hint of the pilot's clothing to the blur of the propeller. The plane's individual panels and insignia mark the era of the piece, too

Ross Head of Design

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Artist info

Anders Lejczak

Personal portfolio site
www.colacola.se
Country Sweden
Software used Luxology modo

Work in progress...

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“This is a girl on a chair with an easy mind. I got the inspiration from my wife. I had been thinking about making a work based around a female, so I chose this subject. I hoped it would be realistic and lifelike”

Jian Xu *Girl on Chair*, 2009

The team Loves

“The ornate carving on the chair is beautiful and adds a dignified edge to the image”

Jo Editor in Chief

Artist info

Jian Xu

Country China

Software used 3ds Max, ZBrush, Photoshop

Work in progress...

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The team Loves

Fantastically vivid colours and a great scene to set the creature in, but the real star of this image is the fur, which is one of the new features in modo 401. Check out the *Polar Bear* tutorial to see this in action as well

Duncan Editor

Artist info

Roger Harris

Personal portfolio site www.rogerharris.net

Country England

Software used Luxology modo 401

Work in progress...

I had just received the upgrade to modo 401 and wanted to try out the new replicator and fur features. This scene was a novel way of doing it. The raptor, which is a base mesh from DAZ 3D, has feathery fur added and the ground is covered in thousands of replicated debris, like leaves, sticks and rocks

Roger Harris *Utah Raptor*, 2009

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> Designers had to create characters and events that involved gadgets, guns, evil geniuses and espionage in some way

Mission possible

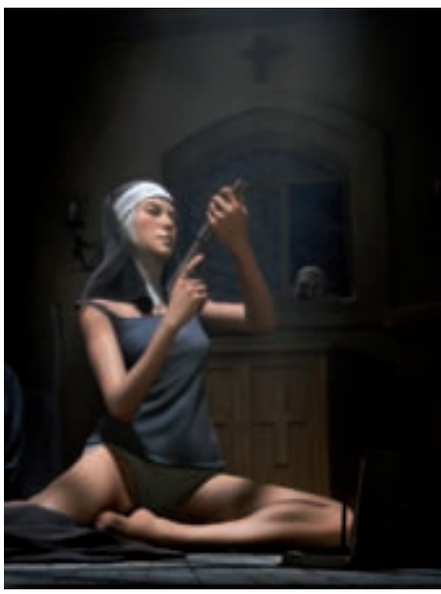
Digital artists scoop prizes in the latest CGSociety competition

The CGSociety has revealed the winners of its most recent challenge, 'Secret Agent'. There were over a thousand entries for the competition, which offered digital artists the chance to win more than $100,000 worth of hardware and software prizes. To be in with a chance of winning, designers had to create characters and events that involved gadgets, guns, evil geniuses and espionage in some way. The finished piece could be in the form of a video or a still image.

There were many different categories for artists to enter work into, including Lighting, Landscape/Matte Painting, Modelling, VFX and Texturing; three of these categories – Individual Video, Team Video and Image – were eligible for Master Awards.

Jose Alves da Silva from Portugal won the Image Master Award for his piece *Mouse Love*, based on a story of a lab rat seeking revenge. Meanwhile, Aurelien Rantet bagged the Individual Video Master Award for 'Run For The Artefact'. The Team Video Master Award was given to a group for 'Agent Omicron'; team members Goro Fujita, Kory Heinzen, Nico Sanghrajka and Ryosuke Fujita created an Eighties-style TV show with a jazz soundtrack.

Judges for the contest included the president of the CGSociety, Mark Snoswell, plus over 20 other industry types and past challenge winners. The many different prizes up for grabs were provided by a wide variety of companies, including BOXX, Autodesk, Wacom, NVIDIA, Maxon and ZBrush. To check out the full list of winners, visit http://features.cgsociety.org/challenge/.



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Did you submit an entry? Seen one you like? Discuss these and more with other 3D artists at **www.3dartistonline.com/forum**

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3D web update

New sites and changes to your favourites – it's all here!

Legal Tender

Tender3D is a new online marketplace that is dedicated to the buying and selling of 3D design work. Purchasers – those with modelling and animation jobs – place their listings on this website or 'out to tender' and then suppliers (essentially, the people who can do the work) will then bid on them.

What's great about this service is that it offers benefits for both sides. Artists and designers have another place to find work and expand their client base, while purchasers can get the best person for the task and discover some fresh talent in the process.

There are no details yet as to how much commission is taken by Tender3D – this was because it was in its beta stage at the time of going to print. However, the service launched at the start of November, so full details should be available at www.tender3d.com.

Testing, testing

Software development company EPHERE has launched an open beta for Zookeeper and is now looking for testers to offer feedback. The scene-management system works with versions 2009 and 2010 of 3ds Max. The plug-in enables you to work fast and effectively in the program by organising, managing and visualising complex scenes. It boasts advanced tree views, layer panels and schematic views, which mean you can view and edit your work with 3ds Max. To apply for a beta licence, visit http://tinyurl.com/ephere-zookeeper/. You can also check out the demo video via that link, too.

Kerby decided to create this image to learn more about ZBrush

Masterpiece

Weathered Temple

Meet Cameron Kerby – he's a hard-surface artist from the USA. We chatted with him about his work

Cameron Kerby www.kerbywithane.com

Cameron Kerby originally chose to create this weathered temple to familiarise himself with ZBrush, as he explains: "At the time I only had traditional 3D modelling practice and I was ready for a challenge." Much of the sculpting was done with brushes, but he says that most of it was created with the help of reference images. The software used included Maya, Photoshop, mental ray, Shake and, of course, ZBrush. If you'd like to take a look at Kerby's work, visit www.kerbywithane.com.

Master the arts

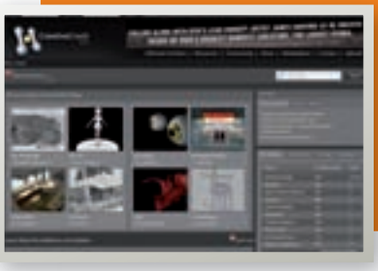
Brush up on your skills

Gnomon is hosting a selection of visual effects masterclasses from 9-23 November 2009. Tutors including Craig Mullins, Sze Jones and Feng Zhu will offer their expertise on various topics, from female character creation to traditional art values. Lessons each last around two to three hours, and one ticket gives you access to all 16 classes.

The lessons will be held online via Gnomon's private forum, which also means that you'll have the chance to chat to your instructor and ask them any questions about the subjects. Tickets start at £225 for students, while a regular ticket costs £295. There's also a studio discount on offer that could save you or your company anything from 10-20 per cent off the price of admission. To sign up or find out more, visit www.gnomonschool.com/master.

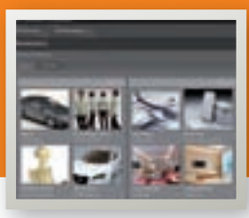
Website of the month

Creative Crash www.creativecrash.com



Highend3d.com and fxshare.com have joined forces and the result is Creative Crash, a site that looks to be a one-stop shop for artists and designers. It offers social and business networking opportunities, 3D learning resources, a community and a marketplace.

Even though it's still at beta stage, the range of resources on offer is impressive. Users will be please to know that there's no application bias here – you can search by software to view members' images or bag some freebies and read through tutorials in the Resources section. Models available in the marketplace are of a very high quality, too.



Creative Crash is a well-designed site with great ambitions. Support the 3D community and take a look for yourself.

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Free 3D Resources

Textures and models

Get your fill of models, textures and software from these here parts

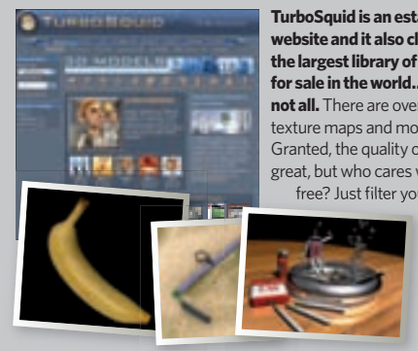
Artist-3D

For a good range of freebies, take a look at this website
Web: http://artist-3d.com/

Artist-3D provides designers with free models, including big chunks of rooms and even a few room scenes. The models vary greatly from Buddha statues and the tops of aerosol cans to a bejewelled crown. In addition to that, there are lots of textures, 3D wallpaper and free software to browse through. Check it out.

TurboSquid

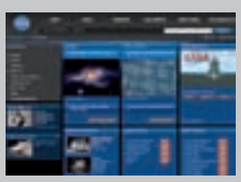
Think that this well-known 3D marketplace doesn't deal in freebies? Think again
Web: www.turbosquid.com



TurboSquid is an established website and it also claims to have the largest library of 3D products for sale in the world... and that's not all. There are over 7,000 free texture maps and models on there. Granted, the quality of some aren't great, but who cares when they're free? Just filter your search and set the price boundaries to zero and you can see the range for yourself.

NASA

Space: the final frontier for freebies
Web: www.nasa.gov



If you're looking for free 3D models and textures with an intergalactic theme, then you might like to take a gander at NASA's website. Click on the Multimedia tab for a drop-down list, and there you'll find the header 3D Resources. There are base stations, flight system supports, 70-metre satellite dishes, plus textures from planets such as Saturn, Venus and Jupiter. What a discovery!

Learning more

Digital-Tutors has a fresh new range of training videos in store for you

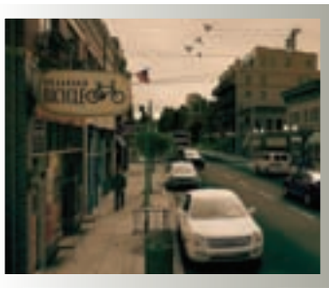
CG tutorial site Digital-Tutors (www.digitaltutors.com) has new lessons for design software such as Toxik, modo, Nuke, Maya and After Effects. You can get an introduction to channels in Nuke, browse through new modelling features in modo 401 or learn about channels and steam nodes in Toxik, as well as other new tutorials. You can even opt for a free trial to test out the service, which gives you access to 12 preselected courses. If you decide on an annual membership, then you'll save $140 over the monthly or semiannual subscriptions. Visit www.digitaltutors.com for more details.

Work in progress

Bike Shop Exterior

Back in issue three we covered a collection of images from environment artist Alberto Hernandez – he's sent us in an update with the finished image

Alberto Hernandez www.albertohernandezjr.com



Alberto Hernandez's aim when first starting *Bike Shop Exterior* was to test out his texture and lighting skills. Using 3ds Max, V-Ray and Shader Map Pro, he managed to create the scene in his spare time over the course of several months. Hernandez always has lots of projects on the go, so if you'd like to check out more of his work then visit his website at www.albertohernandezjr.com.

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Dora, Rail Gun
Don Webster
Personal portfolio site
www.websterandsonsstudio.com

3DArtist 10
www.3DArtistonline.com Practical inspiration for the 3D community

What's in next issue

Learn how this incredible image was created
Issue 10: on sale 9 December
For more issue 10 info, visit www.3dartistonline.com

Prehistoric animals were always a passion of Lomaka's

Artist spotlight

Toy story

Environment artist Chris Lomaka talks us through how he created his latest image

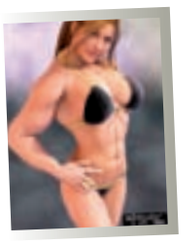
Chris Lomaka www.chrislomaka.com

Chris Lomaka has always had a passion for prehistoric animals. The idea for *Plesiosaurus Playset* came from a quick sketch, as he explains: "I doodled a pterosaur of some sort picking at a carcass with all these flowing lines that I love. I went for a stylised look that I could complete quickly, not really sure where it would lead me. As it went on it looked like a child's toy and I couldn't resist."

To see more of Lomaka's work, check out his website at www.chrislomaka.com.

Software shorts

Get the lowdown on updates and launches



Maxi muscle

She Freak V4 is available from DAZ 3D. The muscle pack is suitable for the Victoria 4.2 figure, and her accompanying skin textures will provide you with four body shapes and eight heads. It's currently in the sale for $20.97, or Platinum members can get it for the absolute bargain price of $1.99.

Asymmetric Bridge

If you're looking for a fast way to transfer data between 3D applications, then you might like Asymmetric Bridge. It's a new piece of software that enables you to move models and animation between programs. There are loads of other great features of the application, so for more details check out http://a-vfx.ru/en/inhousetools/.

Tools of the trade

BAMBOO

Wacom's second-generation Bamboo range offers "multi-touch functionality"

Wacom is well known for its graphics tablets, and is now updating its technology to suit people's everyday computer habits as well as being used for creative work. According to the company, these super-slim tablets offer "multi-touch functionality with pen tablet technology" – what that means to us is that you can select an icon or start an application with the tap of the finger.

You can also flip through a presentation on your Mac or PC, or zoom in and out of an image with the help of your trusty digits. This is, of course, all in addition to the usual creative functionality that one of Wacom's trusty tablets offers.

The Bamboo range is suitable for left- and right-handed users, has a lightweight digital pen and features four customisable shortcut keys. It's just come out in Japan and is expected to hit European stores soon after. To find out more on each product in the range or check out stockists, visit www.wacom-europe.com.

3DArtist online.com
Create your gallery, browse the artwork, chat with experts and artists and get tips and techniques at
www.3dartistonline.com

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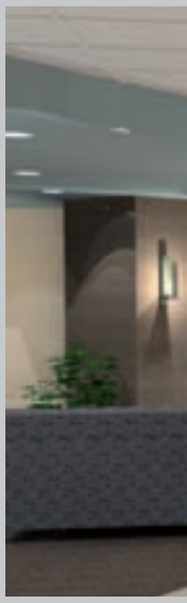
Picture of the month

Ⓐ

Ⓒ

Hail fellow 3D enthusiast! Let your eyes feast upon these, the best images uploaded to the 3D Artist gallery this month



Ⓐ The Willow Pond
» **Dominic Davison**

Dom says: "Rendered in Vue with no postproduction work. This is a similar scene to the one featured in the tutorial in issue 8 of **3D Artist**."
We say: Great trees and a superbly composed scene. It has a real feel of a painting about it. All you need to do is apply an Impressionist style in something like Painter and hey presto, instant Monet!

Ⓑ Patroness
» **Peggy E**

Peggy says: "A warrior woman compiled in Poser 7 with the look and feel being finished off in Photoshop. She is guarding against the destruction of the world."
We say: Nicely composed so that the figure has space behind her, suggesting the area that's being guarded. The colour toning in particular is excellent.

Ⓒ Mustang GT 2.0
» **George Walker**

George says: "This is my updated version of Mustang 2.0 Angle 1. I made a lot of tweaks. The lighting isn't so bright, the windows have reflections now and the railing is casting shadows. Most of this was done in Photoshop utilising different layering techniques. Yes, I know the car isn't moving! I used a variety of programs to get this effect: 3ds Max 2, Photoshop CS3, Filter Forge 4, Paint Shop Pro."
We say: Nice effect from the glaring headlights to the wet tarmac. A closer view would have been even better but great modelling on the car.

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D Lobby looking at fountain
» **Elijah Bell Jnr**
Elijah says: "This is a rendering I completed working at Murray Associates Architects, P.C. While working with client Dan Schunkewitz,R.A.and Interior designer Rene Lanza, I took the drawings and modelled this in SketchUp Pro 6 and rendered it with RPSystems, IRender Lite."
We say: A nicely modelled scene with lots of curving lines and reflective textures.

Share your art
Register with us today at
3DArtist online.com
www.3dartistonline.com
to view the art and chat to the artist

Pictures of the week

HERE ARE THE LATEST IMAGES TO BE AWARDED THE PICTURE OF THE WEEK AWARD IN THE LAST MONTH

Steam Traveller
» **Andrew Averkin**
Andrew says: "An old granddad who saw probably the whole world. I wanted to do this monster long ago. In the scene there are about two million polygons; the locomotive alone has about one million polygons. Rendering time took about 12 hours at a resolution of 2,700 x 3,600."
We say: Excellent detail, a great modelling job.

Longfellow House
» **Dominic Davison**
Dom says: "Rendered and composed in Vue. Plants and foliage from Runtime DNA, Xfrog and Cornucopia3D."
We say: Exquisite oil painting style with a great composition, leading the eye all the way through to the neo-Georgian house.

Dora Awaits in Her Tunnel
» **Don Webster**
Don says: "Famous German rail gun sitting in her protective tunnel. The scene used a highly detailed model of the gun, which was placed into the rest of the scene. It was printed onto a 14 x 40-inch Giclée canvas."
We say: Great model of the gun and superb use of lighting to get the atmosphere in the tunnel.

The Berlin Express Arrives in Paris
» **Len Krenzler**
Len says: "Bill Overstreet of the 357th Fighter group chased an Me109 under the Eiffel Tower in his Mustang named the Berlin Express. The 109 crashed moments later. Bill is still alive, tough as ever, and signed the prints. The Eiffel Tower was a test in patience to model. This image was done in LightWave and a bit of Photoshop postproduction work."
We say: Another great action image from Len here. The Eiffel Tower alone is pretty complex.

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Have your say

Write, email or use the website forums to get in touch about the magazine, your problems or triumphs

Send your letters to...

Email the team directly with your letter
3dartist@imagine-publishing.co.uk

Log in and leave your comments on the forum
www.3dartistonline.com/forum

POST TO:
The Editor, 3D Artist,
Imagine Publishing,
Richmond House,
33 Richmond Hill,
Bournemouth,
Dorset
BH2 6EZ, UK

Animator required

I was wondering whether you could kindly give me some advice. I am a novice with regards to 3D animation. I am looking to find a 3D animator for a project that I am working on but don't know where to start. I am looking for someone who could do photorealism, although am open to other styles. I am aware of very high-end productions such as Digital Domain's *The Curious Case of Benjamin Button*, etc, but wondered which smaller companies are out there. Your advice and assistance would be much appreciated.

Stevie Isaac, by email

You don't mention what this project is but if there is only yourself working on it and you need another person to help out, then I would guess it is a low-/no-cost project. That being the case, then I can't really see even a small company getting involved unless you are offering a fee for the work. If it is just personal work, then your best bet is to advertise for someone to help out and list what you need, specifically listing the software packages, the nature of the project, the time involved and the ultimate purpose or reward. There are numerous website forums that you can post on – try ours at ***www.3dartistonline.com****, or CGSociety, CGHub, CGArena or ones that are specific to the software you are using.*

Stranger in a strange land

My name is Miguel Duque, a 3D CG artist from Macau. Today in Hong Kong I picked up 3D Artist for the first time, and I have to say that I loved it every bit of it. It's definitely an artist-friendly magazine, and I will recommend it to all my friends. Congratulations for the great magazine and I will certainly pick up the next one. I have also registered on your website www.3dartistonline.com. I would like to share my latest work with you and hopefully you will find it interesting. On and off, it took four weeks to work on this 3D artwork, which I called *The Wise Alien Cherokee*. I wanted to demonstrate a cultural fusion between an alien race and ours. A shared knowledge and culture. The software packages used were Hexagon 2.2, modo 401 and ZBrush 3.1.

Miguel Duque, by email

Thanks for sending the image in Miguel, it's certainly an interesting piece and topical with District 9 *in the cinemas recently. The modelling and sculpting are both good, while we also like the texturing. The headdress is great as well. The only things you should look at a bit more closely are the hair, eyebrows and chin, making them extrude from the surface a little more realistically. The eyes could do with a bit more detail, but otherwise it's a good effort.*

The Wise Alien Cherokee
For us, the eyebrows and goatee add to the all-knowing feeling beneath those black eyes. A great image, especially the headdress

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Balanced contents

I received the latest issue on Friday 11 September. It's great being a subscriber, and it didn't disappoint! Not to spoil things too much, issue 7 is a great issue featuring some fantastic-looking articles and disc content. The disc features some great Blender tutorials, which provide fantastic hints, tips and tricks for this great piece of software. There are also some WW1 Navy Battleships (cool!) and some furniture models (unfortunately, the furniture models are saved in .max, format. Shame on you 3D Artist!).

This issue feels far more balanced, with less focus on Autodesk products. The content is more varied, with modo getting a good slice of the mag and featuring in both a full article and a tutorial. Carrara and Poser also feature in tutorials, which is fantastic. The Community section is as useful as ever, featuring an article on earning extra cash from your creations. The Reviews and Workspace sections also have some interesting-looking reviews and articles.

All in all, this is a great-looking issue and I have enjoyed the Blender tutorials. It's great to see this superb piece of software getting some recognition. Great work guys!

Homunculus, on the forum

We're trying to get a balanced diet of tutorials across as many software formats as possible. Obviously, as Autodesk is the leading company in the industry, it has more software packages and a greater market share than any others, so more images are made with those packages. However, you can look forward to more LightWave, modo, Poser and CINEMA 4D tutorials in the issues to come.

Get your free stuff

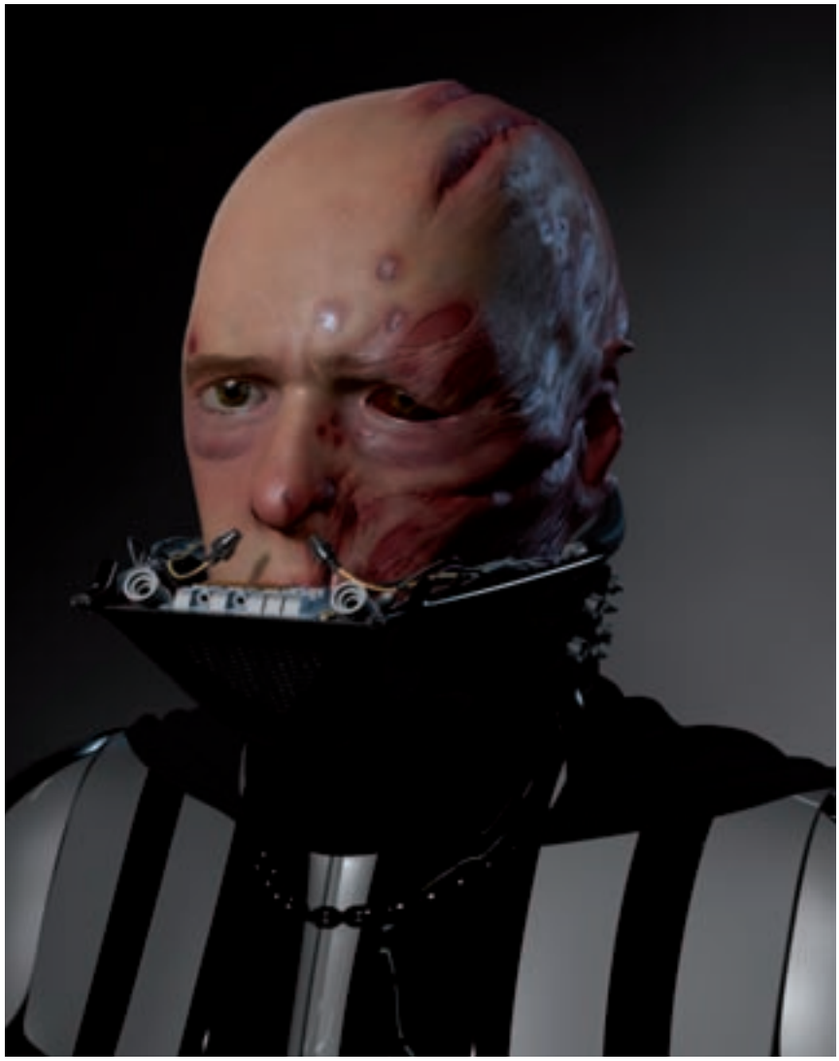
Team Dystopia features items that have a Dystopian look and feel to them, and it provides models for Poser, Vue and LightWave. It also has freebies on its products page for Poser and LightWave. Team Dystopia can be found at www.team-dystopia.com.

Ghost Wulf, on the forum

Thanks for posting this, always worth getting stuff for free!

No-go internet

I love the mag, 3D Artist, it's the best cotton-pickin' mag of its kind on the market today, so if you keep up the standard, then I'll keep buying! There is, though, one major gripe I have, and that's the cover disc. When it comes to this, all magazines in this field frustrate me no end when it comes to installing the free programs that you offer. My gripe is that an internet connection is needed either to access some files or to install the programs in order to register them and get a serial code, etc. As I am not connected to the internet, installing the programs – especially Vue 7 Pioneer that I was excited about in issue 2 – is not an option. Why can't you consider people like me who are not online by offering a way to install and use these programs without going online?



Darth Jaydar
Jason McNamar sent in this image titled *Darth Jayder*, in which he produced a mutilated version of his own head, as he explains: "It is a self-portrait as Darth, and was created so I could brush up on my 3D skills and try my hand at a human character." Not bad, keep up the good work

In the past I was able to go to my local online centre to register and grab a serial or activation code by going to the program's website and registering from there. Would you consider offering an alternative along similar lines to those of us who are not online so that we can install and register the programs?

J.T. Bradfield, Wirral, UK

Interesting question. It used to be that you just needed to register a code to activate the program, but the software companies have decided that it's even more useful for them to get your details online and activate the program directly. It also helps reduce piracy significantly. The bottom line in all of this is that we do not dictate how the program works because we don't make it. It's down to the software companies themselves and this kind of registration is usually obligatory in order to get the software for the disc in the first place. It also has to be said that by not being online you are missing out on so much in the world of 3D, whether that's from information and answers to questions, showcasing your work to other artists, even getting free models and resources.

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Duncan Evans talks to Mike Fink, CEO of Prime Focus VFX, about developing one of the world's largest VFX studio groups

Bringing VFX into focus

> Vancouver has benefited from a favourable currency rate, strong tax credits and a long local history of feature film production, so we've seen a surge in film and TV production spending in British Columbia

Mike Fink is CEO and senior visual effects supervisor of Prime Focus VFX

Company Prime Focus

Founded Frantic Films VFX, recently rebranded to Prime Focus, was founded in Winnipeg, Manitoba, Canada in 1997. Prime Focus was founded in Mumbai, India in 1997

Company website www.primefocusworld.com

Country LA, New York City, Vancouver, Winnipeg, London, Mumbai, Goa, Hyderabad, Bangalore, Chennai

Expertise Previsualisation, animatics, equipment hire, visual effects, video and audio postproduction, digital intermediate, digital asset management and distribution, R&D software development

Client list Major film studios – 20th Century Fox, Miramax Pictures, Paramount Pictures, Warner Bros., Summit Entertainment and, of course, clients across the entire Bollywood market

Software used Autodesk Maya, Autodesk 3ds Max, eyeon Fusion, Deadline, Krakatoa, Flood, Awake, CLEAR, Terragen, V-Ray, FumeFX, Adobe CS4

Mike Fink is CEO and senior visual effects supervisor of Prime Focus VFX, based in Canada. He's been doing visual effects for 32 years, starting at a time when there were no classes, online courses or even books dedicated to VFX. Coffee-table books on visual effects just didn't exist. Fink's first job in the industry was as an electronic consultant on *The China Syndrome,* produced by Michael Douglas who also starred alongside Jane Fonda, in which he helped build a nuclear reactor control room and a computer. The movie was released in 1978 and chronicled the story of a near meltdown of a nuclear reactor. The movie was released the same week that the Three Mile Island meltdown accident happened, and it was exactly as depicted in the movie – a strange case of life following art. This was Fink's first movie experience and was an ideal one, because it was on budget, on schedule and everyone was terrifically collaborative. The experience there immediately seduced him into filmmaking.

3D Artist: *What were you doing or where were you working before Prime Focus, and what education or training have you had relevant to this kind of work?*

Mike Fink: Before *The China Syndrome,* I was a teacher and administrator at CalArts, and before that had been a portfolio manager in San Francisco for a division of Bank of America while going to school at night to get my MBA. I eventually quit both to go to art school. That was a long time ago.

Before Prime Focus, I was a senior visual effects supervisor on *The Golden Compass,* and won an Academy Award, a BAFTA award and a VES nomination. I was also a visual effects supervisor on movies like *Braveheart, X-Men* and *X2.*

3DA: *We understand that you've just moved into a new purpose-built office in Vancouver, British Columbia. What can you tell us about the facility?*

MF: While we've seen feature film production languishing stateside, Vancouver has benefited from a favourable currency rate, strong tax credits and a long local history of feature film production, so we've seen a surge in film and TV production spending in British Columbia. When we decided to expand, it made sense to establish Vancouver as the primary visual effects facility for Prime Focus in North America.

The new Vancouver studio is now four times larger, and can house 150-200 artists

Ⓐ *Mr Magorium's Wonder Emporium.* The original film production was never designed to use VFX, it was all puppetry and in-camera effects. After viewing the original, final scene, the director decided to call in the VFX cavalry

Ⓑ To create a more magical ending for the film, Frantic reconstructed the scene using particle and fluid simulation in almost every shot. The artists added 3D birds, ample amounts of pixie dust and a sunny, holographic light

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Key Project 1

G.I. Joe: The Rise of Cobra

We contributed 124 visual effects shots for the Stephen Sommers-directed movie *G.I. Joe: The Rise of Cobra* from Paramount Pictures. Prime Focus's Los Angeles, Winnipeg and Vancouver visual effects studios provided expertise in previsualisation, digital environments, fluid simulation and high-volume particle rendering for the movie's action-packed finale sequence involving a complicated aerial scene.

and support staff. It's located in the city's thriving downtown district, and has all the fixings: the most up-to-date technological pipeline, a 50-seat screening room with stereoscopic 3D viewing capabilities, luxurious client meeting rooms and individual studios for our different VFX departments. We also have ultra-high-speed data connections and Polycom video conferencing connecting the Vancouver studio with Prime Focus offices – and our clients' facilities – worldwide.

3DA: *Additionally, why Canada? You have offices in Winnipeg but also in LA, so why go to Vancouver?*

MF: Frantic Films VFX was founded in Canada by Chris Bond, who is now president and senior visual effects supervisor for Prime Focus VFX. He lived in Winnipeg, so that's where the company was based. The story, however, of how Frantic set up the Vancouver office is that there was a small group from Frantic working on *The Core* for visual effects supervisor Greg McMurray in Vancouver, doing previsualisation work and some shots on the movie. I came up to Vancouver to check things out for *X2* and met up with Greg, who told me over dinner, "You have to check out the guys at Frantic who do great previs." I liked what I saw and got them to swing over to our show, and they started doing previsualisation in addition to a number of shots and sequences on the movie. At that point, Frantic didn't have a Vancouver office – it was just using production offices for whatever show it was working on. After *X2*, Frantic rented out a small space in Vancouver, mostly to handle previsualisation work, and that grew with the addition of VFX supervisor Chris Harvey, who was fairly well known in the Vancouver market. During that time, Chris Bond was spending so much time meeting with filmmakers and studios in LA that he moved there, and that started the LA facility.

Of course, there are a lot of attributes about Vancouver that make it an attractive place to do film, and I mentioned some of that above. Canada offers tax rebates, has a long history of being a hotbed of CG development, stemming from companies like Alias, Houdini, Discreet Logic and so forth. So there's already a pretty wide talent pool in Canada, and Vancouver is overall just a beautiful city. People like working here.

The Vancouver office will be interconnected to Prime Focus's network of offices in Los Angeles, New York City, Winnipeg, London and across India via CLEAR, Prime Focus's proprietary web-based media asset management system.

3DA: *What are the main services that you offer and the areas of VFX that you cover?*

MF: We specialise in providing creative and

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> We specialise in providing creative and technical VFX services to the entertainment industry

technical VFX services to the entertainment industry, and have dedicated departments for 3D, 2D, matte painting, effects animation, creature and character animation, R&D and other digital departments. In addition, we offer software packages such as Deadline, our render management tool, and Krakatoa, our high-volume particle renderer.

3DA: *What functions do your other offices around North America serve?*
MF: Winnipeg deals primarily with R&D and software but also production, mostly compositing, as well as effects animation and simulation.

Vancouver incorporates matte painting and environments, character animation, lighting and rendering, compositing, effects animation, previsualisation and simulation.

Los Angeles focuses on matte painting and digital environments, lighting and rendering, previsualisation, compositing, 3D, lighting and rendering, effects animation and simulation. When Prime Focus acquired Frantic, it also acquired Hollywood's Post Logic Studios, so our LA office also has digital intermediate, colour correction and digital postproduction capabilities.

What's been great about Rob Hummel coming on board for Prime Focus as CEO of postproduction for North America is that he and I are able to bring the capabilities of Frantic Films VFX and Post Logic together. We're in the same building in Hollywood and we're leveraging the incredibly talented people on both sides of our building.

However, the main thrust and growth of our company in North America is the Vancouver studio, which is the primary visual effects production centre for Prime Focus North America. We're building up Vancouver's abilities in every aspect, including effects animation, simulation, animation, lighting and rendering, compositing and stereoscopic filmmaking. And we are all linked by Prime Focus's Global Digital Pipeline, which allows seamless working practices across the international facilities.

3DA: *You were originally called Frantic Films VFX, so why the change of name?*
MF: Prime Focus acquired the VFX and software/R&D portions of Frantic Films in 2007 (however, the live-action portion was not acquired and is still in operation). Prime Focus simultaneously acquired Post Logic Studios at that time as well.

Because Prime Focus was made up of a number of businesses and brands in numerous locations with differences in vision, culture, sector disciplines and ways of working, it was necessary to unite these companies under one single brand with one set of values, one clear brand position and one strategic vision. We launched under one global brand name, which was Prime Focus,

C The pleasant environment at the Vancouver office for Prime Focus VFX, formerly Frantic Films. This is one of a number of Prime Focus sites around the world

D Wireframes and live-action compositing for *G. I. Joe: The Rise of Cobra*, the summer action flick. The final sequence featured a high speed aerial chase © 2009 Paramount Pictures. All Rights Reserved

E Frantic's Vancouver and Winnipeg facilities handled the bulk of the 334 VFX shots for *Dragonball Evolution*, with VFX supervisors Chad Wiebe and Mike Shand overseeing the work

F Ken Nakada, one of the industry's leading matte painters, oversaw about 30 matte painting shots from Frantic's Hollywood studio

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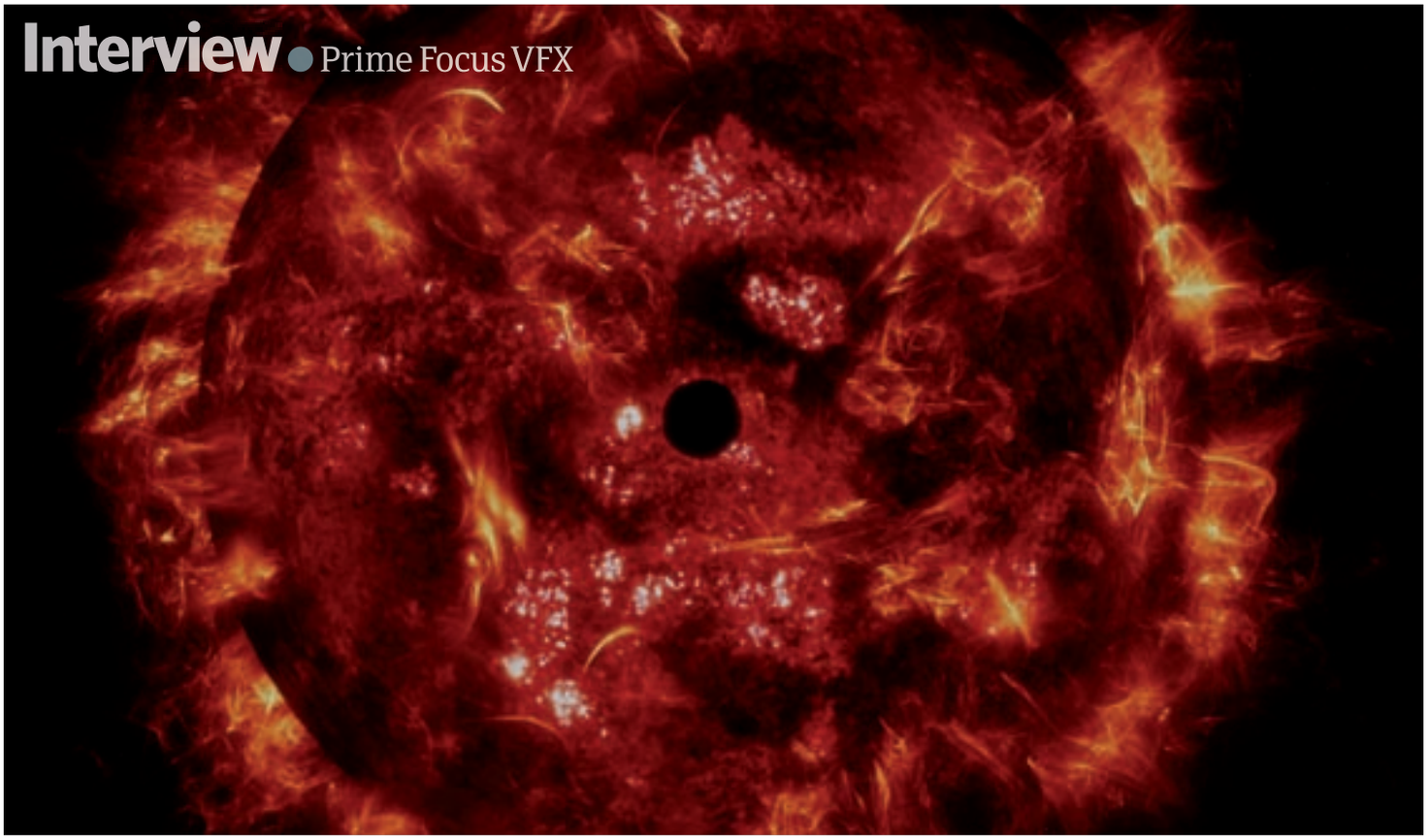

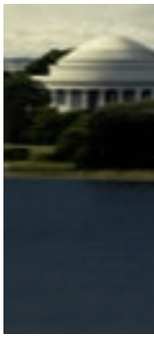

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with launch galas in London and Los Angeles on 1 October.

3DA: *A couple of recent releases you worked on were* Red Cliff *and* G.I. Joe. *What were you called upon to do for those?*
MF: For *Red Cliff*, we contributed a number of visual effects shots, most notably for one of the film's key naval battle scenes. We were tasked with creating the entire environment surrounding a massively destructive attack waged on an enormous fleet of ships – all within an eight-week production schedule.

For *G.I. Joe: The Rise of Cobra*, we contributed 124 visual effects shots. Our LA, Winnipeg and Vancouver visual effects studios handled previsualisation, digital environments, fluid simulation and high-volume particle rendering for the movie's action-packed finale sequence involving a complicated aerial scene, in which a plane is being eaten away by Nanomites, US-developed bioweaponry usurped by evil forces that disintegrates metal on contact.

We contributed roughly 70 visual effects shots for this aerial sequence, and developed a custom toolset to generate three-dimensional clouds and sky environments. We built a Nanomite animation pipeline using our proprietary volumetric particle renderer Krakatoa, along with 3ds Max, to render out the billions upon billions of particles that make up the Nanomite cloud. We also built a hybrid matte painting, environment and 3D animation pipeline.

> "For Red Cliff, we contributed a number of visual effects shots, most notably for one of the film's key naval battle scenes"

Ken Nakata headed up the digital matte painting department in Los Angeles to create the CG sky and clouds using a combination of fluid dynamics, matte painting, CG simulation and particle simulation. Prime Focus also created missile contrails and built the White House and Potomac River entirely in CG. In addition to the finale, Prime Focus also contributed to the film's opening sequence (in which a tank is destroyed by Nanomites) and provided interior shots and set extensions for the Cobra base, as well as digitally building the Night Raven plane, including its inner workings and engine, which are revealed as the Nanomites eat away the metal.

3DA: *Were there any particular technical challenges on* G.I. Joe: The Rise of Cobra *that you had to overcome, and if so how did you do it?*
MF: The finale sequence was particularly challenging because we were not relying on any aerial photography, which would be practically impossible to shoot at these speeds, but instead created nearly everything digitally: the aeroplane, sky, clouds and the destructive Nanomites that eat away the plane.

We also had as many as two 3ds Max scene files, two Maya scene files, two Terragen scene files and multiple Photoshop files per shot. Keeping all of these render passes in order was difficult enough, but there were often camera changes, too! When this happened, new camera nodes had to be created for all the scene files for rendering multiple passes from each scene file. All these passes necessitated a large farm, so rendering was a challenge.

Clouds are unique entities with unique lighting qualities and their atmospheric integration into their environments is

G A VFX shot that Frantic contributed for the *Superman Returns* film. This shot used the company's proprietary fluid mechanics system to generate the effect

H In the John Woo epic *Red Cliff*, Frantic got involved for the second part of the film, working on the massive naval battle, which involved hundreds of burning CGI wooden boats with crews

I Frantic was responsible for 123 shots in a pivotal and frenetic five-minute sequence in which the film's characters stand atop a raft on turbulent 100 per cent CGI sea. Picture courtesy of New Line Cinema

J A combination of matted elements on geometry, fully rendered geometry and matte painting. Prime Focus also created missile trails and built a complete CGI version of the White House and the Potomac River for *G.I. Joe*

K The basic geometry for the White House in a fast action flyby shot. By building virtual elements for almost the entire scene the action was created at a speed that would have been practically impossible to film

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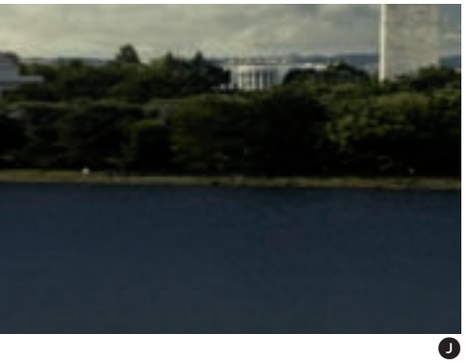

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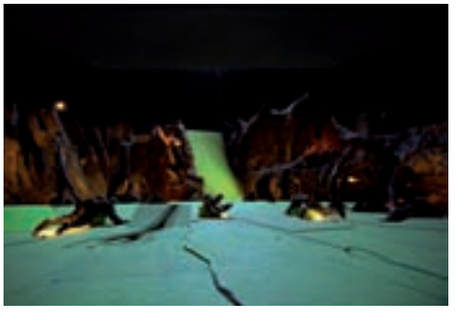

complicated. We addressed this challenge by investigating as many tools as possible to replicate them, trying to find a pipeline that utilised as few tools as possible.

We found we needed the strengths of many different software packages, as well as different VFX techniques, and opted to write custom tools to achieve our goal, which led to a cluster of fun trying to keep all the passes straight. Spreadsheets that each artist could update simultaneously were key, and compositing had to be able to keep track of all these passes as well. Everyone had to be absolutely religious about updating their elements and inform artists downstream about the updates.

3DA: *What other projects are you working on at the moment?*
MF: We're in the midst of production on several shows right now, including *Tooth Fairy*, starring Dwayne Johnson, Julie Andrews and Ashley Judd, about a minor league hockey player who must serve a one-week sentence as a tooth fairy. Unfortunately, we cannot talk about our other film projects, but will be able to in a few months.

3DA: *What software tools do you regularly employ at Prime Focus?*
MF: We use the latest versions of Autodesk Maya, Autodesk 3ds Max, eyeon Fusion, proprietary software tools Deadline, Krakatoa, Awake, Flood, CLEAR (our digital asset management system), Terragen, V-Ray, FumeFX and Adobe CS4.

3DA: *You also have a division called Prime Focus Software. What's the remit of this division and what kind of products/ software has it come up with?*
MF: We've commercialised four primary visual effects products: Awake, a set of stereoscopic 3D plug-ins for eyeon Fusion, Deadline, our very popular render queue management software, and Krakatoa, our high-volume point-based particle renderer.

3DA: *What are your plans and ambitions for the company in the future?*
MF: To continue to grow our Canadian production capability. Our Vancouver hub is now capable of doing four times more work than a year ago, and in a year we hope to be doing six times more work, and by the end of the first quarter of next year or so we're hoping to have 150-200 people in Vancouver. We'll be maintaining the size of our presence in Winnipeg and LA, but building out Vancouver as the main production hub. The goal of Prime Focus Worldwide – and I also hold the job title of president of visual effects, Worldwide – is to continue to grow and expand our two main visual effects hubs in Mumbai and Vancouver.

Key Project 2

Dragonball Evolution

In its former life as Frantic Films VFX, Prime contributed 334 shots to the feature film *Dragonball Evolution* from 20th Century Fox. Directed by James Wong, it starred Justin Chatwin, Emmy Rossum, Jamie Chung and Chow Yun-Fat in the live-action film adaptation of the popular Japanese manga comic book series. The Vancouver and Winnipeg facilities handled the bulk of the VFX shots, with VFX supervisors Chad Wiebe and Mike Shand overseeing the work. Ken Nakada, one of the industry's leading matte painters, oversaw about 30 matte painting shots from Frantic's Hollywood studio, while additional rotoscoping and paint work was completed at parent company Prime Focus in Mumbai. Prime Focus Group company Machine FX, in London, also contributed plate treatment to about 35 shots. Frantic and its partner studios worked directly with the film's VFX supervisor Ariel Velasco-Shaw and VFX producer Janet Muswell Hamilton.

"Because the movie is based on a very popular anime series, and because fans tend to scrutinise comic-book adaptations much more than regular films, Mike Shand and I acknowledged that this was sacred material," shares Chad Wiebe, co-VFX supervisor at Frantic Films VFX. Mike Shand, co-VFX supervisor at Frantic Films, also contributes: "This meant we had to be extremely careful and thoughtful in the crafting of the visual effects, particularly regarding the look and development of the energy effects used by [characters] Goku and Piccolo."

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No more *rubber* monsters for the new DOCTOR WHO

Meleah Maynard talks to Will Cohen, Jean-Claude Deguara and Nicolas Hernandez of The Mill about their visual effects work on Doctor Who

When BBC One relaunched the long-running sci-fi program *Doctor Who* in 2005, no one expected it to be the hit it has become, with an average of eight to nine million viewers per episode. The much-loved show, which was cancelled in 1989 after suffering from poor ratings for some time (in part due to bad time slots), was at first intended to be educational when it aired in 1963.

The plan was to have Doctor Who, a Time Lord from the planet Gallifrey, travelling through time in his ship, the TARDIS, which would turn into something appropriate for the period of each episode – a pyramid, say, or a Trojan Horse. Budget realities, however, meant the vehicle needed to take one form, a Sixties police box, and stick to it. The ongoing explanation for this was that the TARDIS's chameleon circuit had malfunctioned so it was no longer able to change form.

Although some of the actors who have starred as the Doctor over the years have been more popular than others, Christopher Eccleston, who became the ninth Doctor when the 2005 series kicked off, was an immediate hit with fans and critics. In addition to winning the TV Choice/TV Quick Award for Best Actor that year, Eccleston, his likeable human travelling companion Rose (played by Billie Piper) and *Doctor Who* all won awards at the UK's National Television Awards. The show also won two BAFTA awards the following spring, including Best Drama Series.

Despite this success, shortly after the second series was announced Eccleston quit the show citing fears of being typecast. His replacement David Tennant became the tenth Doctor, starring first in 2005's Christmas special 'The Christmas Invasion' before joining Rose for another year of adventures until she left the series at the end of the season. Her replacement Martha Jones (played by Freema Agyeman) starred alongside Tennant throughout the third series.

While continual shifting of main characters would be next to impossible for most shows, *Doctor Who*'s plot line that the Doctor can regenerate into a new form when mortally wounded makes these switches more palatable. Eccleston's transformation into Tennant happened in the season finale, aptly called 'The Parting of the Ways'.

After series three, it was announced that once series four was finished, the show would be taking a break in 2009. Instead of the usual episodes, *Doctor Who* would return in four specials to be broadcast throughout the year. Tennant, who played the Doctor through the completion of all of the specials, will be replaced by Matt Smith when the series returns in 2010.

Unlike the old series, in which stories were told in a serialised format, the newly launched *Doctor Who* features 13 45-minute episodes that are meant to stand alone (or occasionally as two parts). Rubber monsters and the trashy special effects of the past have been replaced with state-of-the-art CG created by The Mill, a London visual effects house.

» The Last of the Time Lords
To create the aged Doctor who appears in 'The Last of the Time Lords' episode, The Mill used its own in-house facial mocap system. It also created its own hardware, which consisted of a head-mounted camera that could give instant feedback on performance

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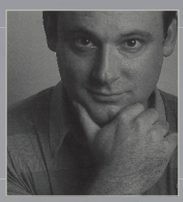
Key people



Will Cohen
Group director for Film

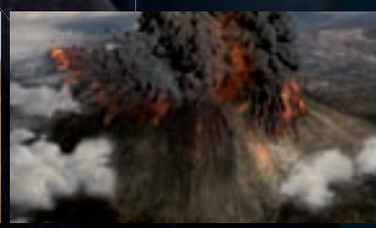
Nicolas Hernandez
CG supervisor at The Mill

Jean-Claude Deguara
Joint head of Film/TV and 3D at The Mill

> “Rubber monsters and the trashy special effects of the past have been replaced with state-of-the-art CG created by The Mill”

» Voyage of the Damned
The Titanic was modelled in Maya and composited in Shake using live-action elements of explosions

» Planet of the Dead
Matte painting with green screen live-action foreground footage



» The Fires of Pompeii
This matte painting of Vesuvius was composited in Shake using multiple particle passes

Matt Smith copyright BBC Pictures

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» *Partners in Crime*
This turntable of the Adipose mother ship was modelled in Maya

The best of the VFX

As with most things, the first year of creating visual effects for *Doctor Who* was the hardest. The learning curve was steep, hours were long and The Mill's TV and Film department consisted of just five people. "At first we had animators and modellers working on each creature, everyone was just doing everything really," recalls Jean-Claude Deguara, joint head of Film/TV and 3D. "But as time went on and we added more structure to our process, animators were sticking to animation and modellers were sticking to modelling, so things ran more smoothly."

By the time series two was under way, the creative team had developed a streamlined system for working closely with the show's executive producer and head writer, Russell T. Davies. "Russell learnt quickly not to overwrite anything," says Will Cohen, group director for film and TV. "He would pick up the phone and ask us, 'First off, can I have a digital werewolf?' And we would say yes and explain that the parameters were that it could emote but not speak, it could be partially covered in hair and it needed to appear only in night-time."

The werewolf, which was featured in 'Tooth and Claw,' the second episode in series two, was the first big creature The Mill's artists made for the show. Muscular to the point of being ripped, as Davies had requested, it appeared in over 50 shots, including extreme close-ups, so the fur had to be photorealistic. "This was a massive challenge for our early pipeline," explains Deguara, adding that the fur was created using Maya's useful Shave and a Haircut plug-in.

In addition to tackling the challenge of fur, The Mill's artists created a dramatic close-up transformation sequence where the live-action actor transforms into the CG werewolf inside a CG cage. "The werewolf was a real turning point for us," Deguara adds. "It was when we realised we could do a full CG creature." From that point on, The Mill's TV and Film department began to grow.

To help streamline the process, The Mill's CG supervisor Nicolas Hernandez developed a whole new render pipeline specifically for the project. "We wanted to do more of the conceptualising of the creatures, so we made a miniature film pipeline for TV," Hernandez explains. Most episodes took four to six weeks to complete. Artists used Maya for modelling and animation, Photoshop and ZBrush for texturing and painting, CINEMA 4D for matte painting and

Standout episode

Blending computer graphics animation with live action is a tricky challenge to attempt

Critics had very positive things to say about the effects used to create the Adipose, short, white, blob-like aliens that appeared in the 'Partners in Crime' episode in the fourth series. A departure from *Doctor Who*'s usual offering of scary, imposing monsters, the Adipose were small and looked a bit like marshmallows. They were made from human body fat after a company called Adipose Industries began marketing a dubious-sounding diet pill with claims that 'the fat just walks away.' And, in fact, it did in the form of these alien creatures, which spawned each night from the dieter's fat.

The Mill made the army of Adipose with Massive, which is most often used to create crowd sequences. Being a big *Doctor Who* fan, Stephen Regulous, the creator of Massive, came to The Mill for four weeks to help work on the episode. "We had to animate 50 cycles that were then imported into Massive and used to make the characters 'think' about their movements," Deguara explains.

» *The Adipose*
The Mill made the army of Adipose who take to the streets of London in the 'Partners in Crime' episode with Massive

David Tennant, copyright BBC Pictures

23 November 1963	29 October 1966	21 June 1969	3 January 1970	8 June 1974	21 March 1981	16 March 1984
William Hartnell (the first Doctor)	**Patrick Troughton** (the second Doctor)		**Jon Pertwee** (the third Doctor)	**Tom Baker** (the fourth Doctor)	**Peter Davison** (the fifth Doctor)	**Colin Baker** (the sixth Doctor)

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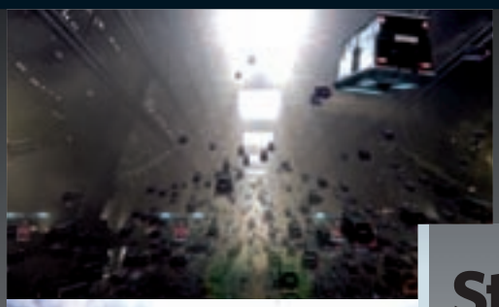
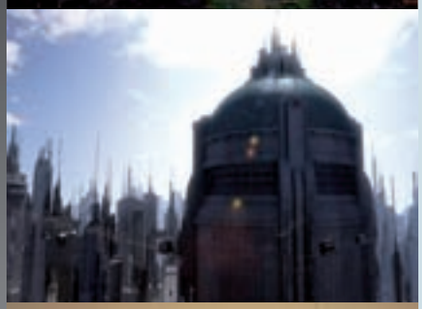




» *Gridlock*
Matte painting made in CINEMA 4D. This matte painting was in 2D, which allows for 3D-style camera moves

Standout episode

Blending computer graphics animation with live action is a tricky challenge to attempt

» *42*
The SS Pentallian was modelled in Maya and textured using Photoshop. For the flaming star, artists used Maya 2D fluids driving a displacement on the sun's surface

For an episode in series three simply called '42' (which, perhaps not coincidentally, was the answer to Life, the Universe and Everything, according to Douglas Adams's book *The Hitchhiker's Guide to the Galaxy*), The Mill used Maya to make the freighter ship SS Pentallian, which was textured in Photoshop.

The Doctor, along with his then companion Martha Jones, have 42 minutes to save the crew and their ship, which is hurtling through space toward a fiery star. The star was created using Maya 2D fluids driving a displacement on the star's surface. The corona effect was made with the Stroika particle plug-in. "We rendered out 40,000 elements for this," Deguara explains. "Then we composited those in Shake as a single 1,000-frame sequence, which was used in 20 shots."

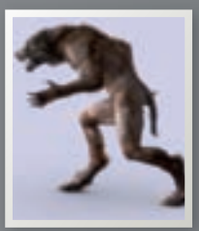
Mudbox for displacement. Nuke and Shake were used for compositing.

Although CG-heavy characters appeared regularly on the show, the TV and Film team can name several that they think stand out from the crowd. Among those are the Pyroviles, humanoid-like creatures with a rock-based form that appeared in 'The Fires of Pompeii' episode in series four. "The rocks were rigged to move over the lava skin and not collide with each other," Hernandez explains. For a later scene where the character shatters into tiny pieces, artists achieved the effect using a combination of rigid body particles and hand animation. FumeFX was used to make the Pyroviles breathe fire.

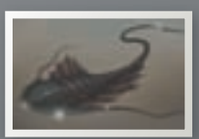
In an odd twist, the Doctor himself becomes a creature in the 'Last of the Time Lords,' the season finale in series three. With the Master in power and the human race enslaved, the Doctor appears as an aged prisoner in this episode. The old Doctor, as the character is known, was the first character on which The Mill used its in-house facial mocap system, as Hernandez explains: "We created our own in-house muscle system that we used to create the facial rig. Then we captured David Tennant's performance and transferred the data onto the facial rig, giving us almost 90 per cent of the facial animation."

Having been with the show since its relaunch, The Mill has seen budgets for digital effects go up every year as it became apparent to everyone that impressive CG was part of *Doctor Who*'s renewed success. "We started out doing it at a cost of about £700,000 out of love for the show," says Cohen. By the end of the fourth series the budget had swelled to £2,000,000, with The Mill working on several episodes at one time. Budgets for the one-hour specials are handled separately, with the last two coming in at about £650,000. "I think at first they were worried about marketing the show, because everyone had a huge affection for the first show and its rubber monsters," Cohen recalls. "Nobody knew what it was going to be like to try to make a show in today's world of *Harry Potter* that could stand up to what children are watching on their TV and videogames."

Making the budget stretch over an entire series can be tricky, but over time the team has worked out a system for balancing CG-heavy episodes with others that rely more on matte paintings than effects. "We talk a lot so we know where we're saving money and where we're spending it on something people can really sink their teeth into," Cohen says. "It is amazing because we've had to master making monsters, animation and compositing; it's like working on a whole new TV show every month."

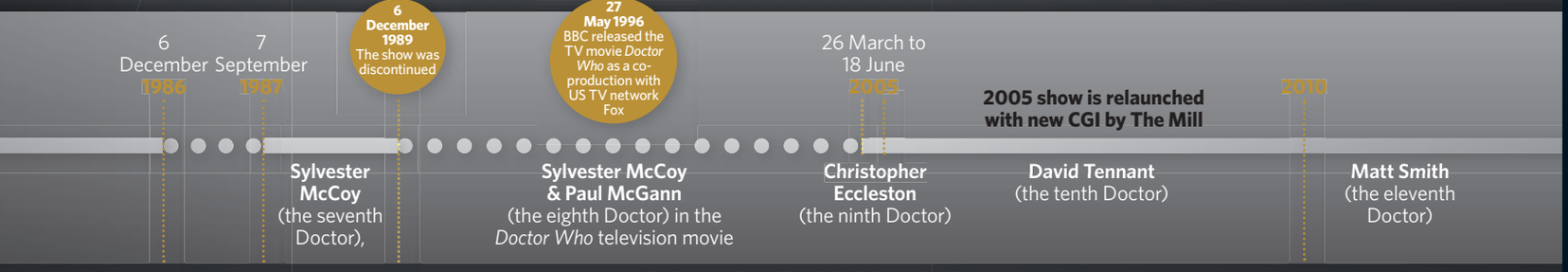


» *Tooth and Claw*
Photorealistic fur on the werewolf was made with Maya's Shave and a Haircut plug-in



» *Planet of the Dead*
This stingray concept was created in Photoshop. "In-house concepts help us with modelling and rigging," says Cohen

> "The Mill has seen budgets go up every year as it became apparent that impressive CG was part of Doctor Who's renewed success"


6 December 1986
7 September 1987
6 December 1989
The show was discontinued
27 May 1996
BBC released the TV movie *Doctor Who* as a co-production with US TV network Fox
26 March to 18 June 2005
2005 show is relaunched with new CGI by The Mill
2010
Sylvester McCoy (the seventh Doctor),
Sylvester McCoy & Paul McGann (the eighth Doctor) in the *Doctor Who* television movie
Christopher Eccleston (the ninth Doctor)
David Tennant (the tenth Doctor)
Matt Smith (the eleventh Doctor)

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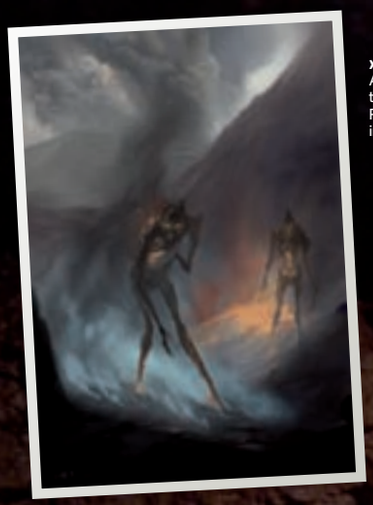

» *Pyrovile concepts*
An early concept of the rock-based Pyrovile aliens made in Photoshop

The many specials of Doctor Who

Following the success of the first *Doctor Who* series, the BBC began producing specials to accompany the show, including an annual Christmas episode. In addition to doing all of the CG for the series, The Mill also creates the visual effects for each special.

With no series airing in 2009, the BBC opted to do four one-hour specials before the start of series five in 2010, not including the 2008 Christmas special 'The Next Doctor'. The first of the four, 'Planet of the Dead', ran in April as the Easter special. The second, 'The Waters of Mars', was scheduled for an autumn release, while the last two specials are planned as a two-part story that will air over Christmas and possibly New Year's. All of the specials have been written, or co-written in some cases, by Russell T. Davies, who will be leaving the show in the capable hands of new executive producer and head writer Steven Moffat in 2010. A Scottish television writer and producer, Moffat is a longtime fan of *Doctor Who* and has already written several episodes of the new series.

Past specials include:

2008/9:

'Music of the Spheres', seven minutes, *aired on* **1 January 2009**

'The Next Doctor', 60 minutes, *aired on* **25 December 2008**

2007:

'The Infinite Quest', animated serial, *aired* **2 April – 30 June 2007**

'Time Crash', eight-minute special, *aired* **16 November 2007**

'Voyage of the Damned', 72-minute special, *aired* **25 December 2007**

2006:

'The Runaway Bride', 60-minute special, *aired* **25 December 2006**

2005:

'Doctor Who: Children in Need', seven-minute special, *aired* **18 November 2005**

'The Christmas Invasion', 60-minute special, *aired* **25 December 2005**

'Attack of the Grask', 14-minute interactive episode, *aired* **25 December 2005**

» *The Fires of Pompeii*
Pyrovile turntable on Vesuvius backplate, created in Maya using Mudbox and ZBrush for displacements and textures with Maya particles for smoke and fire

Matt Smith and David Tennant courtesy BBC Pictures. All other images courtesy The Mill. *Doctor Who* images are copyright BBC Pictures

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WILL COHEN INTERVIEW

When Phil Collinson got the job as producer of *Doctor Who,* he called Will Cohen to let him know, as The Mill had worked with him in the past. "We said, 'You have to let us pitch for it'," Cohen recalls. The Mill was given a couple of scripts to break down and budget, and there were some tests to do before meeting with Russell T. Davies and producer Judy Gardner. "And then they gave us the job," Cohen continues. It wasn't until much later that they learnt the reason for their good fortune. "Russell said it was because we said we just wanted to help tell the stories, and we were nice and had a good laugh with them."

As they head into the making of the fifth series, we asked Cohen and Deguara to talk a little bit about their experience doing all of the visual effects for *Doctor Who*. Here's what they said:

3D Artist: ***Was doing something like* Doctor Who *a completely new experience for you?***
Will Cohen: Yes, as none of us had ever done anything quite like that. We had 13 episodes to make for the time and money that was on offer, and we wanted to help raise the benchmark for what was possible for a British TV program. So we were very careful about how we set the job up to emulate a feature film as closely as possible. We were also careful to get people who didn't just want to be told what to do. We wanted to have a lot of creative input because we knew there wasn't enough time to go back and forth. We had one shot to get things right.

3DA: ***Why did the BBC decide to bring* Doctor Who *back after all these years?***
WC: A few people had been championing it over the years. We felt a lot of pressure when we made that first series. We knew a lot of people would watch it and we wanted it to be good. Honestly, though, we thought we were going to work on it once and there would be one series and that would be that. Nobody expected it to be as successful as it has been. It took us all a little bit by surprise.

3DA: ***What was it like to work with Russell T. Davies?***
WC: There was always a hotline to Russell. He worked 20 hours a day for five years on the story. He gave us a big lead time to think about things and he would always ask about new stuff we could do.

3DA: ***What would you say the biggest difference is between old and new* Doctor Who?**
WC: Russell put together a very successful formula. I think the whole idea to root the show in the relationships has been great. If you don't fall in love with the Doctor and the companion, it doesn't matter how good the effects are. It's the stories that people are most interested in. I really think the most clever thing Russell did was that he took a show that was known for being slightly nerdy and he packaged it up and made it fun for the whole family. He rediscovered an audience on British television, an audience they didn't know they had.

» The Next Doctor
The Cyber King marching over Victorian London. This was a full CG shot integrating Maya, FumeFX and CINEMA 4D

3DA: ***Why did the BBC decide to do specials rather than a whole series in 2009?***
WC: They've had a lot of success and everyone's been working flat out this whole time. I think it was time to give the brand – and everyone else – a bit of a rest.

3DA: ***A lot of things are going to change in series five. David Tennant will be replaced by a new Doctor and Steven Moffat will be taking over from Russell T. Davies who is leaving the show. How is it going so far?***
WC: We've already started work on the next series. We've had a lot of creative meetings and talked about what's possible. Obviously, we have a new team now so things are going to change. We're really redefining the show in this new era now that we have a new writer.

3DA: ***What is the biggest difference between doing CG for TV rather than film?***
WC: The biggest difference is the timescale for turning things around and getting things right. Equally, you tend to be guiding clients through the processes involved because in TV the heavy use of CG is generally new to people. You have a different level of experience and knowledge when dealing with film.

3DA: ***Can you name a few of your personal favourite episodes?***
WC: I like episodes that are light on visual effects and heavy on plot and really good acting, such as 'Blink', 'Midnight' and 'The Family of Blood.'

> "If you don't fall in love with the Doctor and the companion, it doesn't matter how good the effects are"

» Journey's End
Most of the detail for the Crucible, the flagship of the alien mutants known as the Daleks, was modelled in Maya rather than displaced

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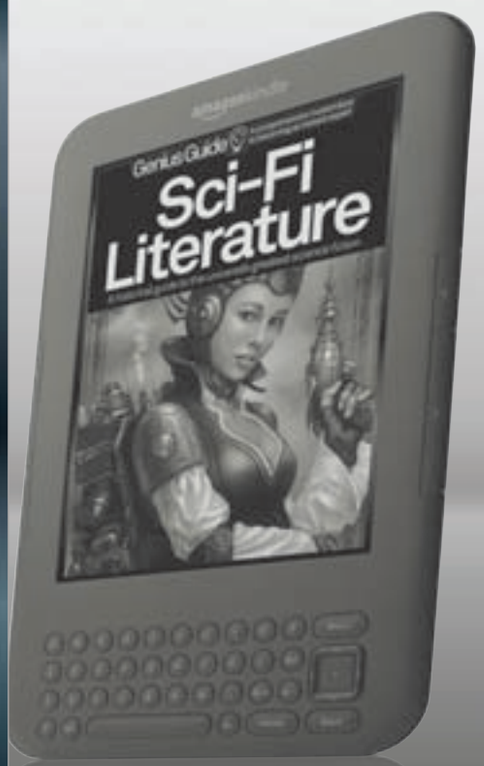

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A "A still frame from our television advert for Sony PSP, which was a recent winner of the Motion Broadcast category at the Digital Artist Awards"

Watching out for creativity

Duncan Evans talks to Ben Davies, MD of The Neighbourhood, about cutting across traditional boundaries, covering everything from games products to architecture

Company The Neighbourhood
Founded 4 July 2006
Company website www.the-neighbourhood.com
Country UK
Expertise A creative production studio specialising in directing and producing intelligent and memorable promotion across architecture, design, broadcast and advertising
Client list Sony PlayStation, CBBC, Channel Five, Renault, TBWA, Make Architects, Heston Blumenthal, Manchester United Football Club, Visa, New York Bagel Company, Urban Splash, Derwent London, LOVE

Ben Davies, MD of The Neighbourhood

It was while working as creative director of Manchester-based Smoothe, a company dedicated to the property industry, that Ben Davies decided to branch out, both in terms of setting up a new company and for having a much wider remit. Together with Jon Humphreys (creative director), Jon Hey (art director) and Tim Woods (technical director), Davies left to set up their new company, The Neighbourhood.

Davies and the other directors focus on leading the company and projects creatively, technically and artistically. When they founded the company, they all worked on every aspect of the projects and development, but as the company grew each director took on a more specific job role. While the remit of the company was to be creative across a wide range of disciplines, underpinning it was the fact that all the directors have some sort of background in architecture, whether practising it, studying it at university or working within an architectural visualisation studio.

It's that background that gives a lot of the workforce at The Neighbourhood a three-dimensional approach to all the subjects they cover, whether they are faithful representations and visualisations or surreal and conceptual.

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3D Artist: *What was the philosophy behind the new company?*
Ben Davies: We wanted to create something much more than just another creative services company; we truly believe in working with rather than for our clients – there's a really big difference there. We try not to limit ourselves to one particular sector or approach.

In terms of our artistic approach, we always start with the project and the client and then have a good think about what we are trying to communicate. What are the main messages we want to get across, to whom and what challenges are we facing?

Like with communicating or marketing any product, there are a whole range of creative options available to communicate the messages, and we try not to restrict ourselves to a particular approach. Sometimes we may conclude that the best way to get messages across is through photorealistic CGI, but just because this is possible, it doesn't mean that we should do it on every project. It's all about the ideas – then we like to build worlds and tell stories about those ideas! Create your own opportunities. Take risks. Have fun!

3DA: *Whereabouts are you based and what was the reason for that?*
BD: We are based in Manchester's Northern Quarter. The reason for that is because Manchester is our collective home and a great creative environment.

3DA: *Is there a particular style or ethos that you bring to your projects?*
BD: We will usually start with an obvious question by asking 'what's the story?' and look for a hook or a vibe. We consider many things to form a melting pot of different ideas, from information about the product and the client, the market, the competition, the budget level – they all go into the mix with things we have seen lately that we love, new tools, new ideas, things we have been talking about for a while, things we wish we had done on other projects, ideas from the worlds of advertising, broadcast and visual design, and the occasional wild card or hunch! Sometimes something will jump out very quickly, whereas sometimes it will take longer. Sometimes it's something that one person will passionately believe in and develop, and sometimes it's more of a team brainstorm.

B

> "Neighbourhood Play is a really important aspect, which is all about dedicating time and budgets to develop the creative ideas that people have in the studio"

C

On a related topic, as a studio it was a fundamental part of our business plan to try to provide the right structure and mechanisms in the studio to develop skills, experiment with ideas and work together well as a team. We call these initiatives Neighbourhood Learn, Neighbourhood Watch and Neighbourhood Play (there's more about those on www.the-neighbourhood.com). These initiatives are all about looking at everything within our studio and culture in terms of beyond that of the financial payoff, and all about us and our team.

Of course, we need to have a sound commercial business that is robust and profitable and all of those things, but as part of that we place a great deal of importance in investing in our people and our ideas, and hopefully we have created an environment where people want to be. Neighbourhood Play is a really important aspect of our studio, which is all about dedicating time and budgets to develop the creative ideas that people have in the studio. We believe strongly in the value that self-generated work can bring to a creative

B "Still frames from our 'Stories from The Neighbourhood' animation – a Neighbourhood Play project and winner of several awards"

C "Lakeshore – apartment project with Urban Splash"

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studio culture and also in attracting commercial work, and have won several awards for projects that we have conceived and generated ourselves.

3DA: *You say that The Neighbourhood works with clients across the advertising, design, broadcast and architecture fields. That's pretty wide ranging. Why do you go for such a wide variety and how did you ensure that the company had the skill base to meet the requirements for working in those fields?*

BD: Ultimately, most of our projects are about communicating a message in the most engaging, compelling and inspiring way. Our experience in architecture enables us to bring ideas to life in this very specialised field, but for us it is all about the ideas, and we don't see any need to limit these ideas to one particular industry. In a world where all sectors are continually cross-fertilising and influencing each other, we're also particularly interested and involved in the crossovers between these disciplines and the new ideas that can happen in these margins. It's an exciting place. A lot of the skills required in each of these areas actually overlap – I think it's often more of a mental attitude when people or studios stick to one particular sector or client base.

Another reason for the wide client base is to lessen the theoretical risk on a business level by a drop-off in any one particular sector. This has stood us in good stead during the current economic climate. In terms of a skill base, we've always believed in a can-do attitude. It's a bit of a cliché but we really do approach every project with a completely blank page as we pull in influences from across the creative and media spectrum. We have a full-time team with quite broad skills in direction, production and management, and we supplement these with specialist talented freelancers on a project-by-project basis to achieve the direction we aspire to and set for the project.

D The Angel Building, London

Key Project
The Angel Building

We were approached to direct and produce a film to promote our client's proposed redevelopment of the huge Angel Building in Islington, London, for use in their marketing suite and potentially online.

Angel Building is the reinvention of an early Eighties commercial building on a prominent but scarcely used site on the corner of St John Street and Pentonville Road, Islington. The building currently lies empty, but over 50 per cent of it will be recycled in a carefully designed scheme by architect AHMM.

We often find ourselves uninspired by a lot of architectural animation, as they can often rely on a dry single-camera move approach – the walkthrough or flythrough. Or, more recently, we have seen a lot of films that rely on overly complex visual effects which, while being visually engaging, often don't effectively communicate the key messages about the product, ie the building.

Our approach was to conceive the film as a symphony, which would build and crescendo as the sleeping giant of the Angel Building awakens as part of the City of London itself waking from sleep. We filmed shots within the city in the dead of night on RED before the music builds, taking the viewer on a dramatic journey through the local context and ultimately through the Angel Building itself.

The journey of light focuses on small details then is ramped up in scale and pace as the film builds to a dramatic crescendo, as the full scale of the building is revealed through a play of light and space. This culminates in a view from the top floor with a dramatic view across the City of London.

Filmed elements were shot on RED, with additional time-lapse sequences on a Canon EOS 5D. All CGI scenes were modelled, animated and rendered in 3ds Max, with V-Ray as our main rendering engine. Additional compositing and grading was done in Adobe After Effects. Final output was full HD 1080p.

E The Angel Building, London

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F PSP Resistance.

Key Project

Sony PSP: *Resistance*

Created as a series of broadcast adverts to promote the release of the new PSP-3000, we worked on a series of broadcast adverts to promote individual game titles, with characters from the games themselves becoming the players of the console. So with *Resistance*, our task involved bringing the Chimera's hands to life.

The agency for the campaign provided us with a loose storyboard, which we were able to push along different routes as the project progressed. We started off by modelling the new PSP-3000 in 3ds Max from supplied reference imagery, then tweaked the model once we had a prototype available. We then received game models for the various characters, although these proved too low resolution to use, as the final outputs were to be at full HD 1080p – so the level of detail in everything had to be top-notch. We eventually turned to Mudbox to sculpt the hands, which were then custom rigged and shaded with subsurface scattering to give the final result using mental ray.

The advert also featured a tricky transformation from human hands to alien hands. This was done in 3ds Max using morphs, along with fluid and particle effects. Finally, the whole advert was pieced together in Adobe After Effects, where we added two-dimensional rocket trails, backgrounds and other finishing touches.

3DA: *Who are, or have been, some of your main clients?*
BD: Sony PlayStation, CBBC, Channel Five, Renault, TBWA, Make Architects, Heston Blumenthal, Manchester United Football Club, Visa, New York Bagel Company, Urban Splash, Derwent London and LOVE Creative.

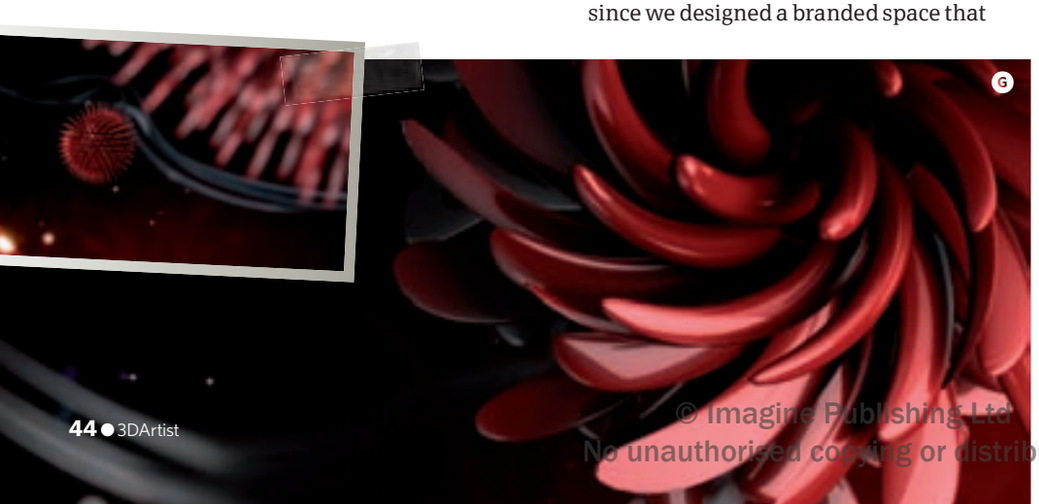
3DA: *You have worked with Sony Europe and on the PlayStation brand. What did that involve and how easy was it to work with such a global brand? Was it restrictive creatively?*
BD: We've completed a number of different projects with Sony now, often in collaboration with other design or advertising agencies. In the case of our recent television advertisement for Sony PSP, we took the new strapline – Your Whole World In Your Hands – initial assets developed for the print campaign and an outline idea for a television advert, and developed these into a treatment and ultimately a finished television advert with the agency (LOVE Creative). It was very easy to work with such a global brand, as we had a direct route to the key decision makers, who enjoyed and valued our ideas.

3DA: *What agencies have you worked with and what were those projects about?*
BD: We've worked with quite a few now. For example, we recently completed a new suite of showreel material for the Manchester office of global advertising giant TBWA to help it create a distinctive offer for its own promotional material, which avoided the usual showreel clichés. It was quite a responsibility to be given to help it communicate its own offer to the world, since we designed a branded space that became a container for its projects.

We've also collaborated on a couple of recent projects with the respected design and branding consultancy Elmwood, to bring aspects of its communication to life in illustrated and animated form in order to extend its campaigns. We've also worked on several projects with LOVE Creative, our close neighbours and all-round good eggs.

3DA: *Can you give us some idea of what type of work you do in the television and broadcast fields, specifically with CBBC and Five?*
BD: For CBBC we completed four idents that the BBC commissioned as part of the rebrand of the channel. This presented us with the unique challenge of animating four scenes each in a two-second time frame – our shortest running time to date!

For Channel Five, having worked as part of the team helping to develop the channel's recently launched new identity, we were



G "The Be Collective. Frames from brand movie"

G "Still frame from our animation for the Sony PlayStation Network"

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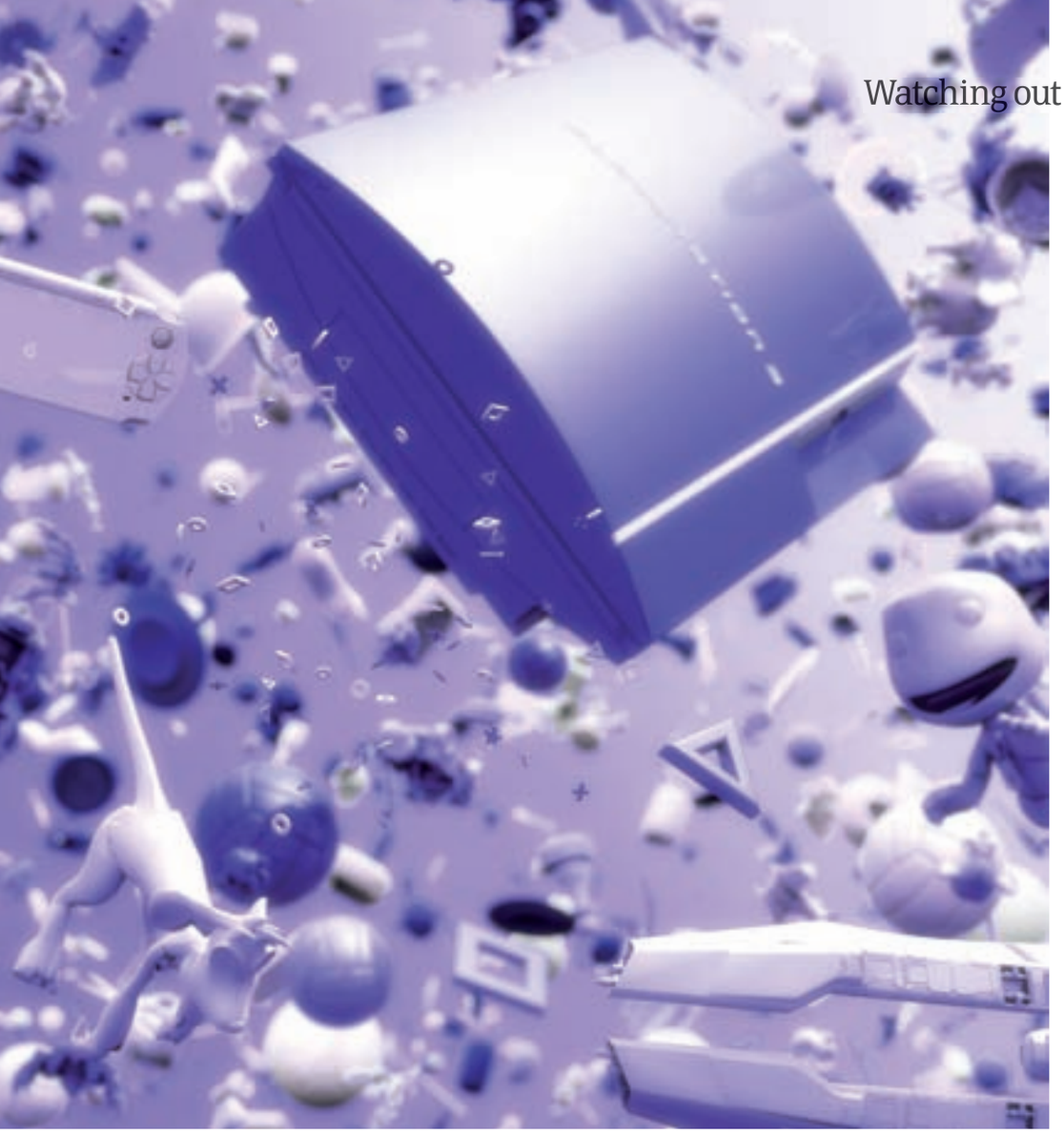


asked to create a special Valentine's Day ident to run for one day only (14 February, obviously). This was commissioned through DixonBaxi, the highly respected independent creative agency.

3DA: *What software tools do you regularly employ and why?*
BD: The main ranges from Autodesk and Adobe are our primary tools – the 3D software that's used the most is 3ds Max.

3DA: *How many people typically work on a project, either in-house or externally?*
BD: It depends on the size of the project. We are a permanent team of 11 and when necessary we draw on the expertise from a team of trusted freelancers we call the extended Neighbourhood. At any one time we may have up to another ten people working for us in this way in our studio with us. Typically, though, a project team will usually be quite small – between three and five people.

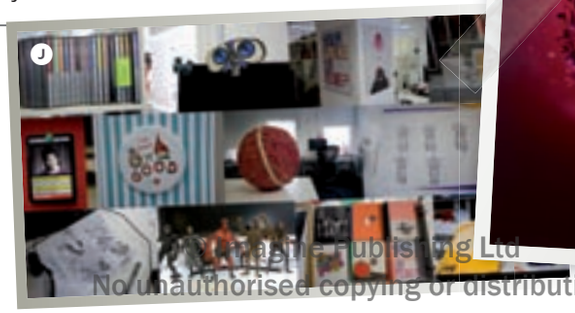
3DA: *Can you give us some idea of the actual production pipeline that The Neighbourhood uses for producing an image or set of images for a client?*
BD: We're probably not too different from most other companies in our actual pipeline. We have four key stages in every project: the big idea; preproduction; production; and postproduction.

One thing that we passionately believe in is that we have to give enough time and nourishment to the first two stages there, the big idea in particular. With all our projects, from architectural still images to television idents to brand movies, the first stage and our approach here will set the tone for the success of the project. It is vital to keep an open mind, to look at the bigger picture, to test and challenge the brief (no matter how well developed it may appear to be) and to ensure that what we propose has the highest chance of success.

> "We are looking to create a vibrant studio that encourages rather than stifles creativity"

3DA: *What are your plans and ambitions for the company in the future?*
BD: One of our most exciting plans is to move premises early in 2010 to a Grade II listed building in Manchester's Northern Quarter. The building was damaged by a large fire in an adjacent building back in 2007, and since then the building has been lying empty.

We will be moving our team and then carefully selecting other companies and individuals to join our neighbourhood and live with us in our new studio, from established agencies to up-and-coming talent. We are designing the space ourselves and are incredibly excited by exploring how a physical environment can promote and encourage creativity. Many design companies have impressive studios, but a lot have been designed to impress clients rather than to function as a great studio – we are looking to create a truly vibrant home and studio for our neighbourhood that encourages rather than stifles creativity. While we're doing this, we are continuing to develop our team and our client base across all our current sectors. We're in it because we are passionate about what we do. I guess it depends on whether you are in it just to make some money or whether you are in it for the love.



I "Still frame from our launch animation for the Sony PlayStation 3"

J "The Neighbourhood studio"

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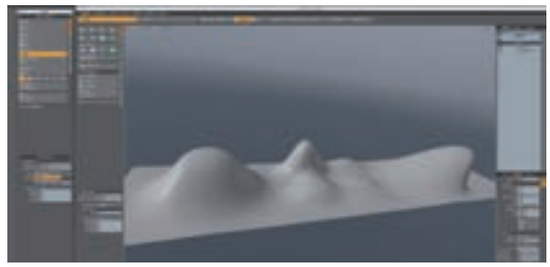
Create realistic wet and dry fur

Polar Bear 2009

> It is good to have your best reference images open during the project so that you can compare your work to a real polar bear all the time

Marcos de Moraes Sampaio is a 3D artist working in the advertising industry



B

behind the scenes

3D artists explain the techniques behind their amazing artwork

Artist info

Marcos Sampaio

Personal portfolio site www.msampaio.com

Country Brazil

Software used Photoshop and modo

Expertise Marcos focuses on print media, bringing to life anything his clients want, from cartoon characters to realistic landscapes. His real expertise is being versatile and fast, while he work exclusively with stills

This tutorial is all about modo, because that's the only modelling, texturing and rendering software used to create this image. Photoshop was only used in postproduction. This tutorial aims to go through all the steps taken to create *Polar Bear*, focusing on the creation of the fur. Its purpose is to give the readers a full insight into how an image like this is created, which tools are used the most and also give nice tips about how to solve some of the most frequent problems that occur while creating a piece like this.

I hope this also shows that there are no big secrets in creating complex images. It only takes a lot of observation, patience and care about details, and a piece of software with good tools that gives the freedom to create.

01 Know your challenge

The first thing to keep in mind in any 3D project is that you need the best references you can get. Google makes this step really easy, since you can get lots of references of polar bears in high resolutions there.

It is also good to have your best reference images open during the whole project so that you can compare your work to a real polar bear all the time and know if you are moving in the right direction. Remember that your work will only be as good as your references A.

02 modo's sculpting tools

Before you start it's a good idea to get familiar with modo's sculpting tools, so open a new modo file, create any geometric form, subdivide it a few times by pressing Shift+D and play a little with them. You can find the sculpting tools by pressing F3. The sculpting tools used the most for this project are Push, Smooth and Move. To get the sculpting tools to work on a mesh, you have to select the desired tool, select a brush shape and then change the Paint mode to Mesh. Remember that you can also control the brush size and offset the amount using the mouse/tablet buttons B.

03 Create a low-poly base

Starting from a cube, use the Extrude tool (select a polygon, point or edge and press X) and the transformation tools (press W for Move, E for Rotate and R for Scale) to model a rough low-poly shape of a polar bear in a standard pose. In

Concept

I wanted to create a scene that was half-underwater. When I decided it was going to be a swimming polar bear, the blueish, cold mood really felt perfect for it.

A

A Some of the references I used for this artwork

B A plane used to test the most important sculpting tools for this project

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Modelling, Texturing, Rendering

Software used in this piece

Photoshop

modo

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this step you don't have to worry about creating edge loops or adding detail C.

04 Increase detail and poly count

To add detail to your low-poly base mesh, hit Shift+D and choose the Smooth subdivision method. Now just start adding detail using the Push, Smooth and Move tools mentioned in Step 2. When you are done, press Shift+D and choose Smooth mode again and add more detail D.

05 Retopology tools

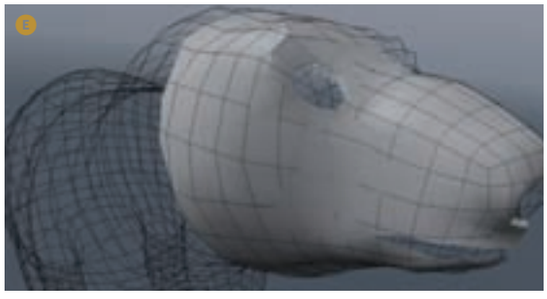
At this point it's time to adjust the topology, creating the correct edge loops. Create a new layer (pressing N), go to the Snapping menu and check the options Geometry and Constrain to: Background. Select the Pen tool and using the polygon type and checking the Merge and Make quads options, start to rebuild the mesh, creating edge loops that go around the eyes and nose, leaving the mouth open E.

06 Detail the loops

Once you have the edge loops in all the body, you can get a lot more detail in the mesh. It's now time for a last sculpting phase using the same tools in from Step 4. Feel free to add new loops during this process F.

07 Open the UV map

Before you pose your model you have to open the UV map. In modo, you can change the fur's settings like length and direction based on image maps, so it's very important to open the UV before you start creating the fur. modo has great UV tools; here, use the Unwrap tool to open the UV map. This tool is great to create UV maps for organic shapes like this one G.



08 Pose the fur

First of all, pose the model in a way that you can set the fur to a nice direction and size for the final shot. You will also need the model to be posed so that you can create underwater fur, knowing how it will be affected by water. The Flex tool is perfect for posing models. You can find this in the Deform tab with modo's modelling tools. It's important to find a pose that looks natural for this animal and that will look nice for the final shot, so it's also a nice time to find a good camera angle H.

09 Generate the fur

Now select all your mesh and hit M to define a material for it. Choose a name for it and hit OK. In the Shader Tree tab, go to the Add Layer option and add a Fur Material. At this point you can see the fur in the viewport and it is applied in a uniform way to the whole model. Select the Fur Material, and in the Fur Shape tab, drop the Flex and Root Bend amount to 0. It's also good to lower all the Jitter values (10% is a good value). This way it will be easier to brush the fur and see the effect of it I.

10 Define fur and skin

Now check the Remove Base Surface option in the Fur Material properties. This way, this particular mesh won't be visible in the render and modo will only render the fur on top of it. Now copy the mesh to a new layer and apply a new material to it. This new mesh and material will represent the skin underneath the fur. It's also good to lower the value of the Fur Length (in the Fur Material properties tab – 10mm is a good value) to help with the next step J.

Lighting and rendering

There are a few tricks that help a lot when rendering fur. First, it takes a lot memory so when you have lots of fur together it's nice to render the model in separate parts if you can. On this one I rendered the head separately from the body. Separating these two parts also makes it more simple to make subtle different light adjustments to the head and to the body without worrying about complex light linking. Also keep in mind that light can generate weird shadow areas in the fur due to the complex shape of it. Choose a light setting that won't only make the fur look soft, but that also generates shadows where you want them to be.

C This image shows three steps of the base mesh creation

D This image shows all three subdivision levels and their detail amount

E Image showing the creation of the edge loops for the eyes

F The polar bear before and after this last refinement with the right topology

G The model and the UV map used to paint the textures

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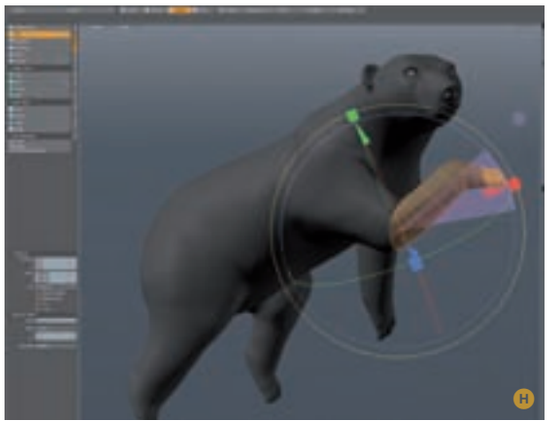
H The Flex tool being used to pose the model

I Image of the model with the uniform fur around it

J The two mesh layers and the two material layers

K The fur being set in the right direction with the Move tool

L Image of the Fur Length being set



11 Set the right directions

Hit F3 to open the Sculpt Tools tab. There you will find the Hair Tools and also a button to add a Fur Direction Texture to your Fur Material. Now select the Move tool (also in the Hair Tools tab), select a brush shape and check the Edit Fur Map option. With this tool you can brush the hair and set the direction of it so that it goes in the same direction as the fur goes on a real polar bear K.

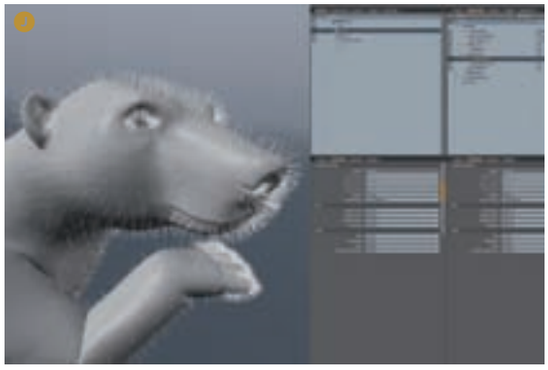
Problems and solutions

The model for this project isn't too complicated, especially because the fur will cover most of it, so it won't require much detail. On the other hand, the main shape of the fur will be defined by the sculpted mesh, so make sure you get the shape of the polar bear right.

modo's sculpting tools work directly on the mesh and also in image-based displacement maps. This project will only require mesh sculpting. It's always good to avoid using displacement, since it requires far too much memory to render, and especially now, when we will be already using fur, which is hard to render on its own.

12 Set the Fur Length

Setting the hair length is almost the same process as setting the directions, only this time you need to add a Fur Length Texture and use the Stretch tool to edit the fur. Now, instead of using a low value to the Fur Length (in the Fur Material properties tab), change it to a higher value L. This because the Stretch tool will only let you reduce the Fur Length rather than make it longer.



M Image of renders before and after this step

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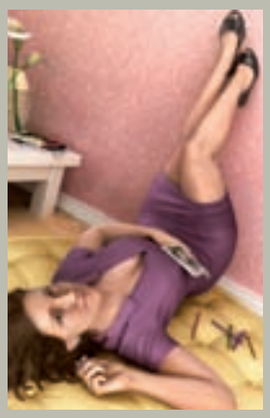
Artist Showcase

Marcos de Moraes Sampaio

I started learning 3D at college and have since graduated as an architect. Before my graduation I working in the advertisement industry in Brazil for 6B Estudio, one of the leading 3D and illustration studios. I've been lucky enough to learn from the best professionals in the market.

Havaianas Goo **Photoshop and modo (2008)**
This image was created to advertise Havaianas sandals for the agency AlmapBBDO. I created four images of this series for this campaign. Art direction was by Danilo Boer, while Rodrigo Gelmi modelled and textured the sandals



Naira **Photoshop and modo (2009)**
This image was created as a personal project, studying the human body using modo's sculpting tools. It took me about one and a half months to do it, working in my spare time

The Pirate **Photoshop and modo (2008)**
This was created to advertise Stella Artois for the agency Borghierh/Lowe. The pirate is a photo, while everything else is 3D. Art direction by Daniel Massih

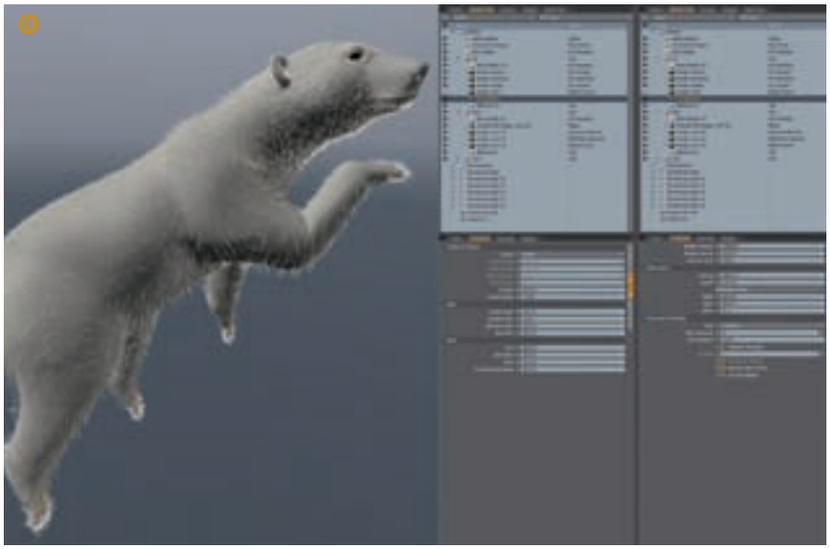
> "Think about the animal swimming, how the water would drag the fur and how its shape would be affected by it"

13 Set the colour and the clumps

Go to your shader tree and add two new image map layers to your Fur Material. Set the first one as diffuse colour in the Effect column in the shader tree. Now press F3 and open the Sculpt tools. You will find the Paint tools there, too. Select the Airbrush, brush shape and your diffuse colour texture in the shader tree. Now you can paint the colour of the fur just like you created the fur shape. The second image will be set as Fur Clumps and use the Hair Tools again to create clumps wherever you find necessary M.

14 Refine the fur using generic settings

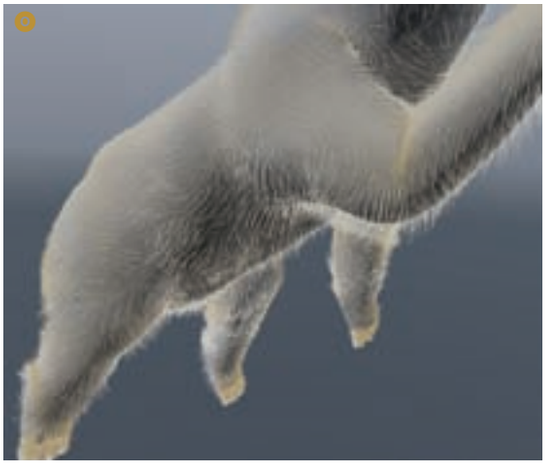
The settings for the direction, length and clumps were mapped and image based, but the other settings should be set in the Fur Material properties tab. This way they will be applied to all the fur in a uniform way. The most important thing here is to set a low value to the Max Segments option to render it more easily. As for the other settings, just keep making render previews and try to match your references N.



N The image above shows some of the settings used for the polar bear

15 Flow through the water

Setting the underwater look of the fur is just a matter of looking for good references and trying to edit the fur directions so that they will match them. Think about the animal swimming, how the water would drag the fur and how its shape would be affected by it. Try to make it as natural as you can O.



O This image shows the direction of the fur when underwater

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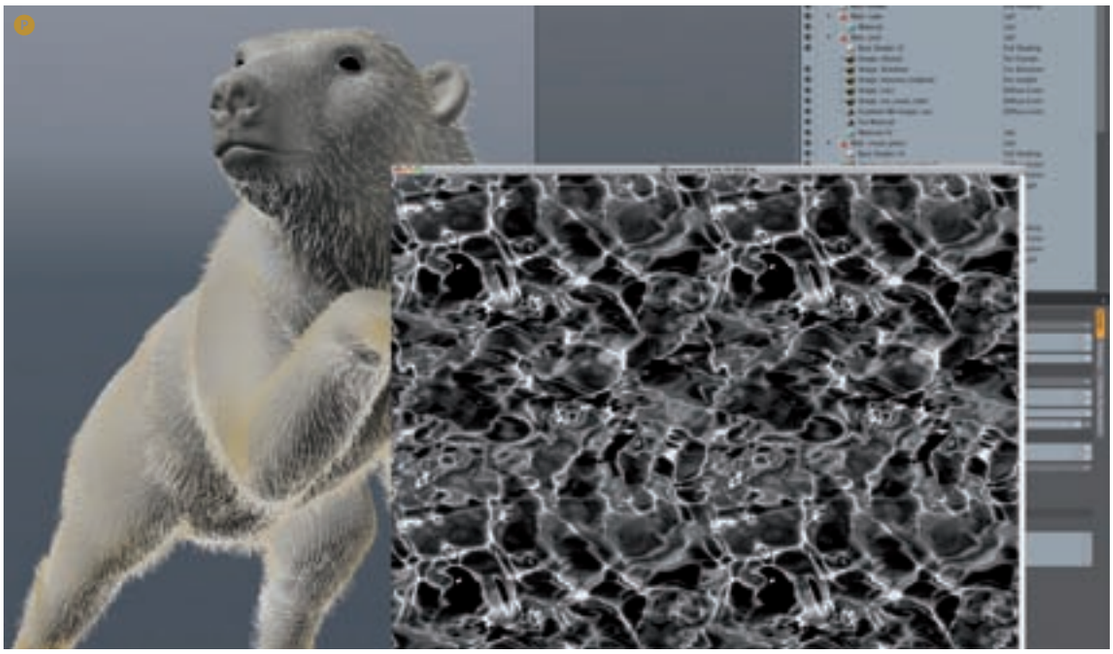


Rendering

An important trick is rendering the fur in at least three rendering passes. This will make your fur a lot smoother. You can change the number of render passes by selecting the Render icon in your shader tree and going to the Channels tab. The number of frame passes is the last option on this tab. You can also smooth the fur by adding subsurface to its material. Just make sure your Scattering Distance is set to 0. Finally, keep in mind that rendering fur usually requires high anti-aliasing settings in order to get rid of noise.

> By setting up the lighting wisely you can improve the quality of your work a lot, so try lots of different light settings

16 Create the caustics

Caustics are very important to set the underwater mood. Since this model will be very hard to render because of the amount of fur, the best way to create the caustics is by adding a black-and-white image with the shape of the caustics to the light material. You can do that just by selecting the desired image in your computer folder, dragging to modo and dropping it in your light material P.

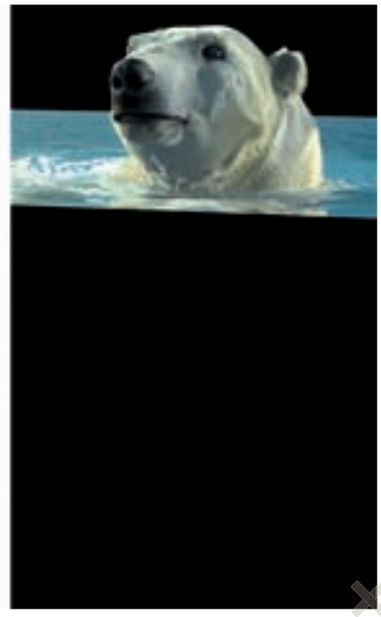
17 Set the lighting

Lighting is a tricky subject because if you do it wrong it can ruin even the best models. On the other hand, by setting up the lighting wisely you can improve the quality of your work a lot, so take your time and try lots of different light settings. For this project, I used basically two main lights coming from both sides of the back of the bear. This created a bit of a dramatic mood, and also brought out the shape of the body and the shape of the fur Q.

18 Last considerations

The head was rendered separately from the body. This avoids issues with a lack of memory and also allows us to turn off the image that generates the caustics when rendering the head. You should also keep in mind that some things are easier done in postprocessing, like colour adjustments, underwater volumetric lights and correcting some minor imperfections to the fur, so you don't have to spend too much time tweaking these effects in modo R.

R This image shows the render of the head and body separated before postproduction



P This image shows the image that I used to generate the caustics

Q This is the top view of the model, which shows the lights that I used

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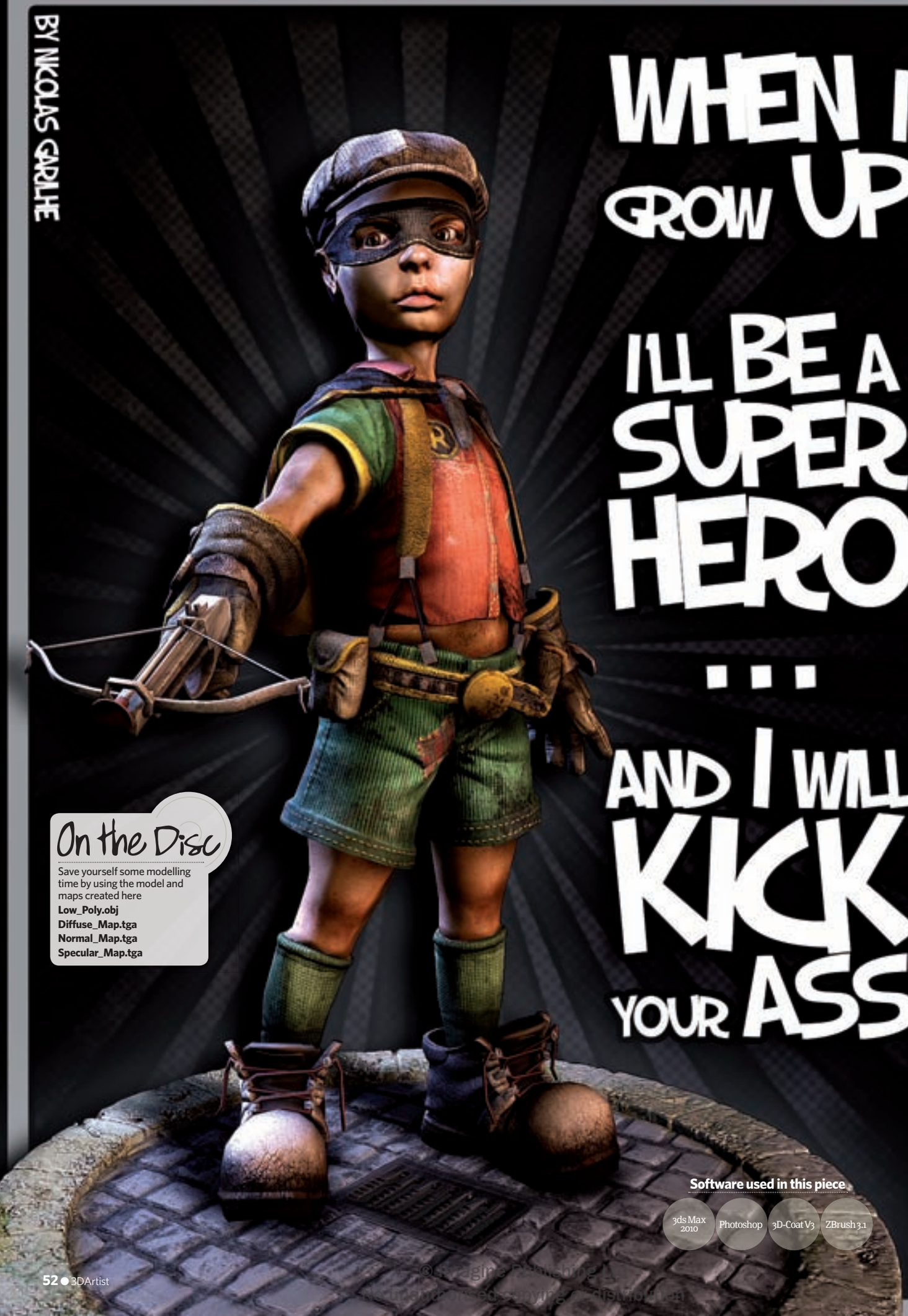
BY NIKOLAS GARLHE

WHEN I GROW UP

I'LL BE A SUPER HERO

...

AND I WILL KICK YOUR ASS



On the Disc

Save yourself some modelling time by using the model and maps created here

Low_Poly.obj
Diffuse_Map.tga
Normal_Map.tga
Specular_Map.tga

Software used in this piece

3ds Max 2010 | Photoshop | 3D-Coat V3 | ZBrush 3.1

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Step by step: Create a street urchin sidekick

Modelling, Texturing

Step by step
Easy-to-follow guides take you from concept to the final render

Artist info

Nicolas Garilhe

Personal portfolio site http://wix.com/guedin/portfolio/
Country France
Software used 3ds Max 2010, ZBrush 3.1, 3D-Coat V3, Photoshop
Expertise Nicolas is a character modeller for videogames

Street Urchin Robin 2009

> The main idea of this project was to pick a superhero and imagine what he would look like if he came from a different time period

Nicolas Garilhe is a character modeller for next-gen games

This tutorial will explain the workflow I used to model and texture Robin the street urchin, step by step. This is for people who want to learn how to make low-poly characters for next-generation videogames. This model was done for an internet competition in which I was asked to create a character with a maximum of 10,000 triangles and with the use of real-time shaders.

I used 3ds Max 2010 for the modelling, sculpted the high polygons with ZBrush and the textures were done with Photoshop and 3D-Coat V3. The topic was to pick a superhero from a comic book and imagine him in a different time period. I took Robin because I thought a young character would stand out from the pack of muscular superhero archetypes, ie The Incredible Hulk and half-naked girls in tight suits. I hope this tutorial will teach you something or show you some tricks that you'll find useful.

Design concepts

Inspiration behind the figure

01 When I start a project, I always have a vague concept (here, it was of a little boy who wants to play the tough guy). The inspiration came from spending time browsing the internet and looking for pictures. Cooliris is a free plug-in for Firefox that I use to browse and it makes my image research much more pleasant.

02 I try to quickly structure my ideas by thinking of what I want to extract from my reference pictures and then bring to my character. For this particular project, I wanted to pick Batman's sidekick, the character of Robin, bring him to the *Oliver Twist* era and then add the design style of the videogame *Fable II*.

03 2D skills are really valuable to draw concepts, but are not absolutely essential (which is lucky for me!). Even if you are not good at drawing, try to draw a concept anyway. We don't need to create a masterpiece in the concept stage, but we are looking to see if the ideas work well together.

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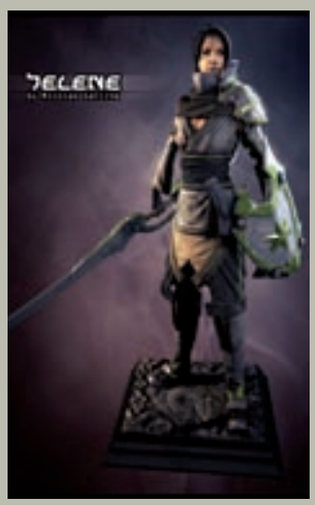
Artist Showcase

Nicolas Garilhe

I started to learn 3D through self-education and by looking at professional work posted on web forums. I recently graduated from the Ubisoft Campus in Montreal, where I participated in the creation of an amateur videogame. Now I'm looking for my first professional job in the videogame industry.



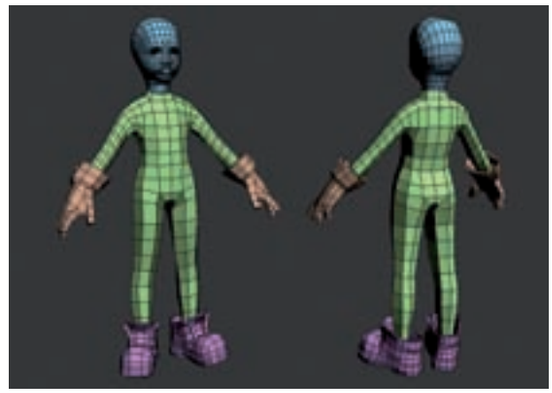
Sélène **3ds Max 2009, ZBrush 3, 3D-Coat V3, Photoshop CS3 2009**
With this model I wanted a character with an original concept. I was inspired by medieval knights and samurai, and I tried to stay away from heroic fantasy clichés. Looking at the final image, the viewer can't really decide if the character is from the past or the future

Skater **3ds Max 2009, ZBrush 3, 3D-Coat V3, Photoshop CS3 2009**
I did this character for my portfolio. I really like the urban style, and I wanted to have fun with the model without spending too much time working on an original concept. I tried to make a skater boy but I didn't want to use the cliché of skater clothes (large clothes, sloppy style, etc)

Naïve Rebellion **3ds Max 2009, ZBrush 3, Photoshop CS3 2009**
This illustration was made for a school course. I wanted to poke fun at people who go against popular culture with their only goal being to gather attention onto themselves. The girl tagging on the wall is making a comment against consumerism but her clothes give her away as a hypocrite

Modelling the urchin

Constructing the figure



04 **When I start** a character I always create a base mesh of the basic body, even if he will eventually have clothing. Building the clothes over the form of the body is easier than starting them from scratch. The head, gloves and shoes will be exported in different subtools.

05 **In this step** I'm working on the character's proportions in ZBrush. Will he be skinny or chubby? Do the legs have to be shorter? This step is important because proportions bring a lot to the character. The details of the skin or the muscles don't matter too much right now because they will be covered by clothes.

06 **I used a** lot of references in order to sculpt the character's face. Children generally have a round face, their cheeks tend to be puffed out and their nose is shorter than an adult's. Be careful not to overaccentuate the muscles or wrinkles in the face, though, which is easy to do when having fun and getting carried away in ZBrush.

07 **Thanks to the** body underneath the clothes, sculpting folds is easy. Where the fabric is in contact with the body, there's tension in the cloth that won't allow folds to form. However, when there are folds, they often converge to the point of the tension.

08 **The retopology was** done in 3ds Max 2010. In order to save time, I export the first subdivision level of ZBrush, which I rework. The most important thing to preserve is the silhouette, as the Normal map will take care of the rest. Apply a material with black self-illuminated diffuse to check if the silhouette works well.

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Lighting and rendering

Bringing the figure to life

2 hour render time
Resolution: 3000 x 4171

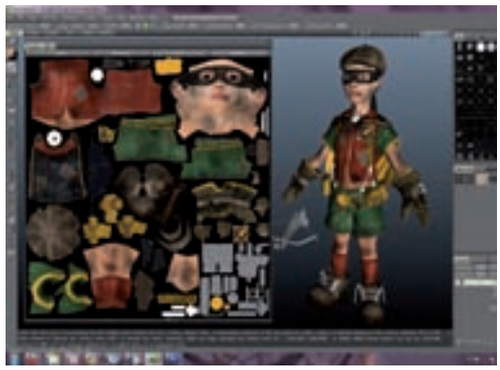
09 For the texturing part I used 3D-Coat V3, which is fantastic. It lets me paint Diffuse, Specular and even Normal maps directly onto the model. The integration of Photoshop in this software is nearly perfect thanks to its projection tools as well as its seamless compatibility with layers and brushes.

10 Inside 3D-Coat V3 I make good use of the projection tools, which can be founded in the Edit menu. There are two projections options: the first one allows you to take a screenshot that you can use to paint on in Photoshop. The other one lets me bring the texture sheet directly into Photoshop.

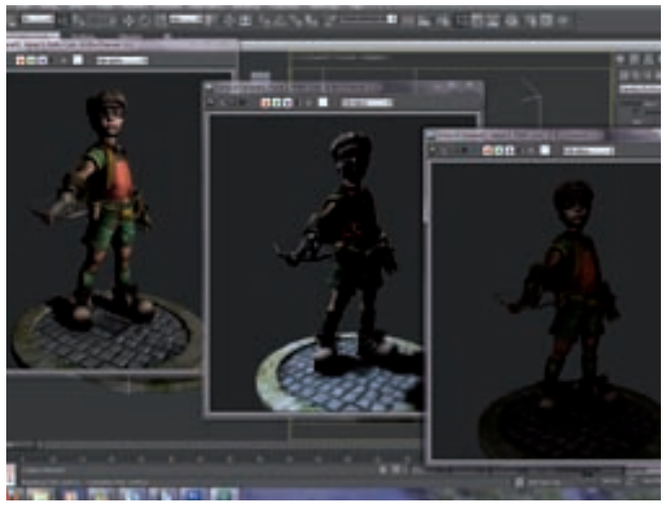
Keep in mind it is low poly

When you have to make real-time characters for next-gen videogames, you need to keep in mind your resource constraints. The polygon budget must be considered even when you are still in the concept stage. Regardless of if your concept is in 2D or 3D, you have to pay special attention to conserving the desired silhouette. You can add as many details as you want to your model, and as long as it doesn't affect the overall silhouette of the mesh, the Normal map will be able to handle it. Unfortunately, overly complex concepts are difficult to convert to low-poly models, and keeping your polygon budget in mind right from the start of the project will save you many headaches as you progress.

11 The first thing to do is to fill the texture sheet with all your base colours on a single layer. Doing so will allow you to easily select these areas with your Magic Wand tool. Next, do a lot of tests on the chosen colours using the Hue/Saturation tool with the aim of making them all work together.



12 The details are added from photos. I just spent some time on the internet looking for grunge or dirty textures, which I used as an overlay layer. For the finishing touches, I like to use custom brushes in Photoshop, which can also be easily found on the internet.



13 For the rendering stage, I used mental ray. The lighting is just a simple three-point light setup. I did a separate render for each light and overlaid them in Photoshop. I used separate layers for each light with the Screen blending mode. This way I could adjust each light in real-time and save on rendering time.

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I made this...

Incredible 3D artists take us behind their artwork

Artist info

Márk Mészáros

3DArtistonline

Username BlackSheepInc

Personal portfolio site www.blacksheepinc.deviantart.com

Country Hungary

Software used 3ds Max 2010, Lightroom, Photoshop, V-Ray

El Chorro
2009

I have always been an admirer of the cars in *Fallout* and, of course, the *Mad Max* trilogy. I had been planning to make my own for ages, but I saw Marek Denko's buggy and it gave me the inspiration I needed to make one. Why a '69 Dodge Charger Daytona? It is one of my favourite cars and I like old muscle cars!

The clouds, depth of field and sky replacement were done in Photoshop from real pictures taken in my garden. Colour correction and the light chromatic aberration was done in Lightroom. Only 28 layers were used.

"I used V-Ray's default Sky and Sun system with a Target light that replaced the sun position. I made all the textures by myself in Photoshop. Every material has Diffuse, Bump and Specular maps"

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I modelled the whole scene using poly modelling. I used the Scatter tool to spread the rocks about, of which there are around 5,000 pieces. The Charger and the jet were made from reference pictures because I couldn't find any blueprints. I've collected tons of reference pictures, from deserts to turbines.

"I used V-Ray's rendering engine. It took me a long time to understand how it worked. I used Light Cache, Adaptive DMC for AA and Mitchell-Netravali"

Software used in this piece

Lightroom V-Ray Photoshop

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Step by step: Create an American muscle car

Chevrolet Camaro 2009

“This month we’re building a 2009 Chevrolet Camaro, a muscle car with a retro styling that’s reminiscent of the classic cars of the Sixties. Our goal is to create not only a photorealistic look, but also a highly detailed and accurate model. And before it’s over, we may add a few touches of our own”

Lance Hitchings, graphics designer

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Part one

Part two next issue

Software used in this piece

Maya

There's any number of tutorials for modelling cars available on the internet, for purchase on CDs and DVDs and in books and magazines. There are also many technical approaches to car modelling: box modelling, poly-by-poly modelling, subdivision modelling, etc. In this tutorial, we're going to try an approach that doesn't see a lot of use: NURBS modelling.

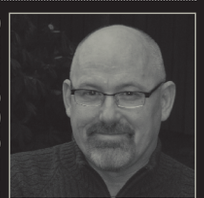
One of the things that makes a car so beautiful to look at – and such a challenge to model – is the long sweeping curves used in their design. When using more common techniques like box or poly-by-poly modelling, the placement by hand of every single vertex makes it very difficult to achieve these curves without ripples, bumps and other distortions.

By building a template of the car in either CV or EP curves and then constructing NURBS patches from those curves, we can achieve beautiful curves. We'll use a bevelling technique to hold all of the seams, creases and corners of the model when we do the final smoothing.

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info



Lance Hitchings

3DArtistonline

Username lhitch

Personal portfolio site www.hitchingsdesign.com

Country USA

Software used Maya

Expertise Lance excels at photorealistic images, particularly of hard-surface objects. Most of his projects are product illustrations

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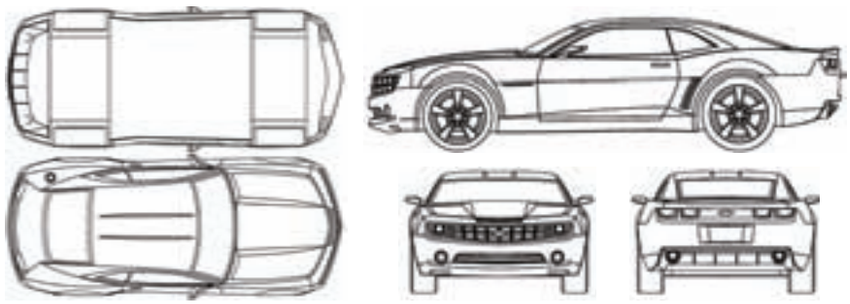
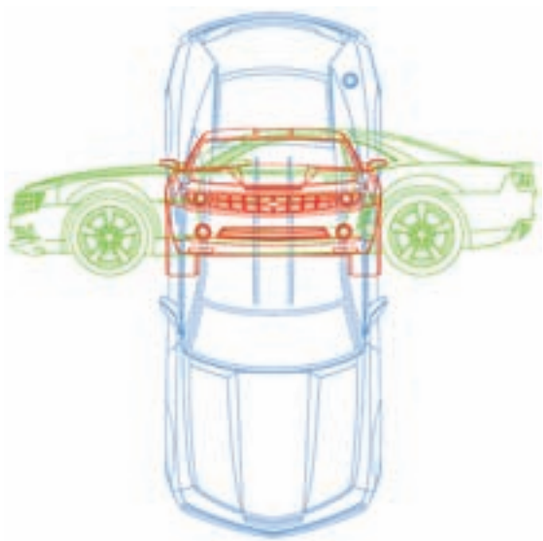
Getting started

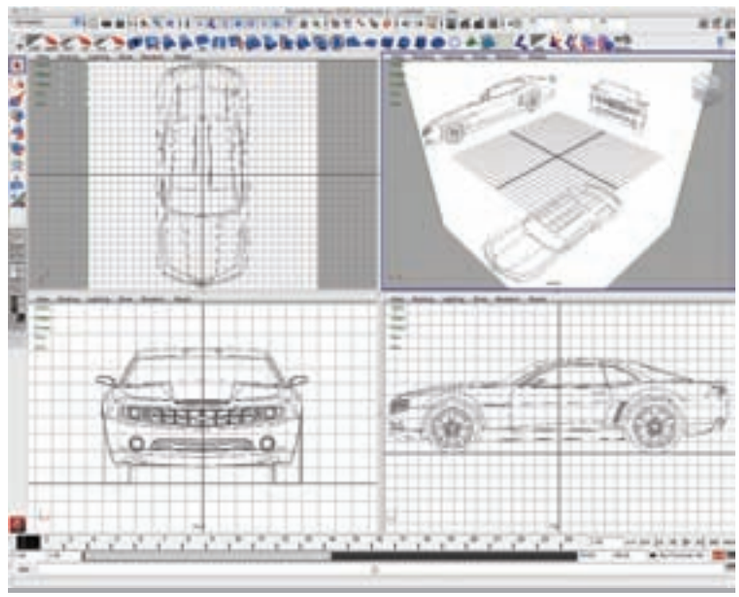
Prepping the files

01 **As with any** modelling project, the first step is always to collect sufficient imagery. Attempting to find images from every angle and of every detail will make your work a lot easier later on.



02 **You'll also need** a good set of 'blueprints'. I use the term loosely, because most of the blueprints available on sites such as **www.the-blueprints.com** or **www.smcars.net** are created by hobbyists, not from the manufacturers. These are usually drawn from three-dimensional models that they have already built. Therefore, the quality and accuracy will only be as good as the skills, research and accuracy of the hobbyist. This is why photos are so important. When the blueprints and the photos disagree (and they will), trust the photos.





03 **In order to** bring the blueprints into your 3D app as templates, you must break them down into separate orthogonal views. Use a square image; I usually go for either 1,000 or 2,000 (1,024 x 1,024 or 2,048 x 2,048). In Photoshop, place each view on a separate layer and line them up. The front view should be centred side to side, the side view centred end to end and the top view centred side to side and end to end. Place the bottom of the tyres in the front and side views at the vertical centre. This will place your model in your viewport at the centre (0,0 co-ordinates) on the X and Z axes, and sitting on top of the 0 co-ordinate in Y.

04 **Open a new** document with all of the viewports at their default view (the default bookmark). Import each orthogonal view into the appropriate viewport as an image plane. In the Attribute Editor, reposition each image plane so that they are out of the way and not bisecting your model. I usually offset the image planes by about 12 world units. So the side image plane would be -12 units in X, the front -12 in Z and the top -12 in Y. In the Attribute Editor I also usually set the Display attribute to Looking through camera so that the image planes don't show up in the perspective view.

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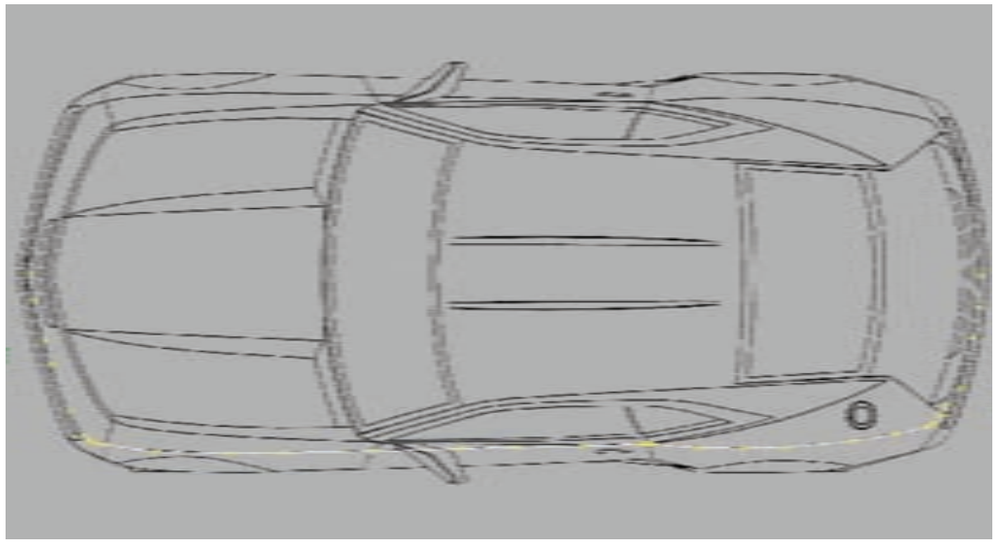
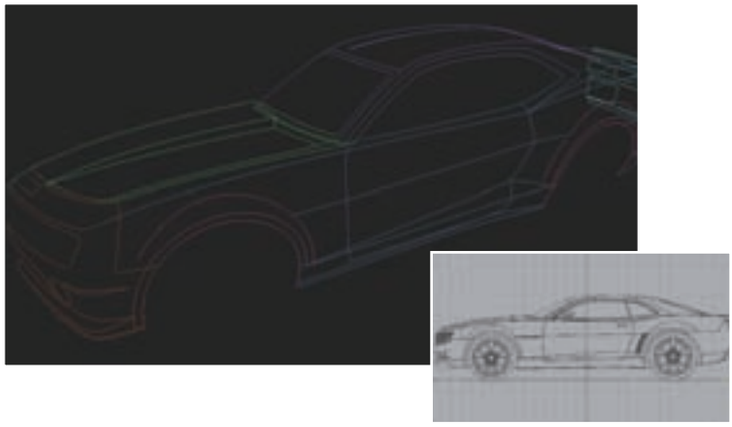
Laying the groundwork

Building a template of curves

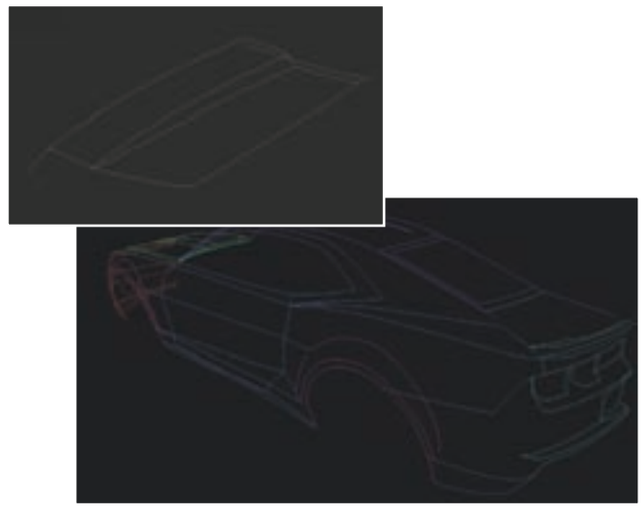


05 **The first step** of the construction process is to build the framework, which is curves. There's no getting around it – this process is long and tedious. But your model will only be as good as your curves, so take the time to do this part right. It's much easier and less time-consuming to tweak a curve than it is to have to go back and tweak a few hundred vertices because you got your original curves wrong.

Let's start with the curve that runs along the beltline of the car. In the below-left figure, we've built that curve in the top view, but as you can see in the inset figure the curve is flat in the Y axis and sitting at the bottom of the model. So we need to reposition each CV of the curve in the Y axis so that it aligns with the side view's image plane.



06 **I've gone ahead** and built the rest of the curves. These are preliminary ones. The curves that will be used to build the NURBS patches will be built from these ones. Building the final curves will require many of the preliminary ones to be used several times, and many of them will be cut into smaller curves.



07 **Now we begin** building the final curves. To demonstrate this process I'll work on the bonnet, since it's a pretty simple shape and only uses four NURBS patches. This is the exact same process we'll be using to build the curves, and then the NURBS patches for every mesh object in the bodywork of the car. In this first image, we see the preliminary curves that we'll be using.

08 **In order to** build the types of curves we'll be using, you'll need to be able to perform basic curve operations: attaching and detaching curves, reversing curve directions and rebuilding curves. The first step is to build curves with precise shapes. Using our preliminary curves, we'll begin cutting them apart so that we have all the curves we need. Here, we're cutting the curve at the front of the bonnet. With your cursor over the curve, click the RMB to bring up the contextual menu and select Curve Point. Now click and drag on the curve to place the point where you want to cut the curve. Hold down the Shift key to place more than one point.

09 **Once all the** points are placed, choose Edit Curves>Detach Curve to break the curve into separate pieces. Here are the ten curves I'll need to build the bonnet after they've been cut apart and the excess discarded.

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The world of NURBS

Using them to construct the surfaces

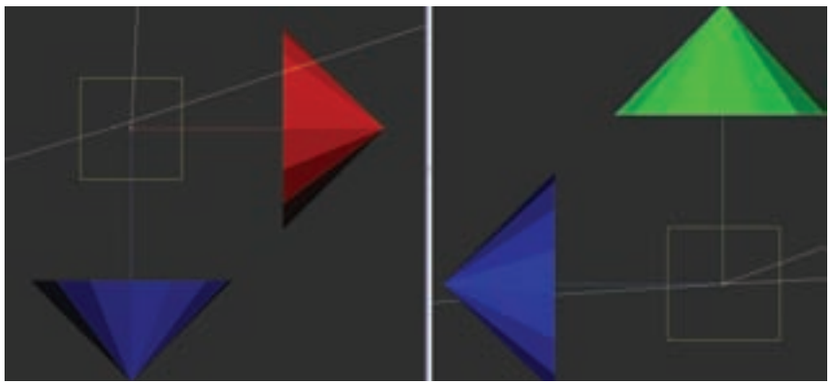
> Each set of curves contains four curves representing the four sides of the NURBS surface or contains two parallel curves to be lofted in a straight line

A note on NURBS

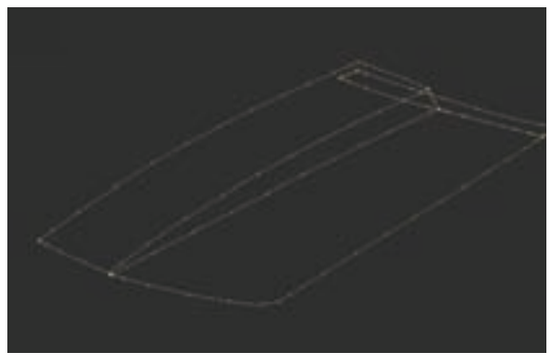
All NURBS surfaces have one thing in common. They all have four sides: a top, a bottom and a left and right side. Even NURBS spheres are made up of four sides. The top and the bottom are compressed into a single point and the left and right side meet along one of the longitudinal lines. NURBS cubes are made up of six separate four-sided patches.

For this walkthrough, we will be building NURBS patches from curves using primarily the Loft and the Boundary tools. The Boundary tool, as well as the Birail tool, works best when the connecting curves have common end points, meaning that the end points for each curve have the same co-ordinates.

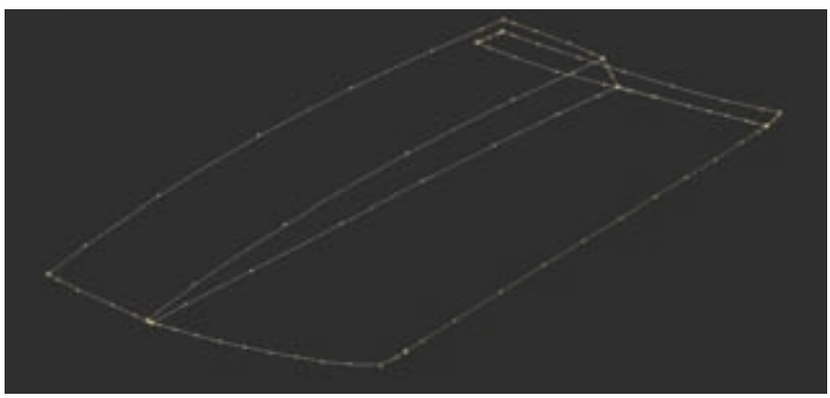
10 **Now we need** to close up the curves prior to building the NURBS surfaces. We'll be using the Boundary tool on the bonnet, so the curves need to have common end points. Here, I'm preparing to move the end point on the long curve to the same co-ordinates as the end point of the far left curve at the front of the bonnet.



11 **Using the Move** tool, you should be able to hold down the C key to snap the point to the curve, and then simply drag it to the end of the curve. However, in my experience this only works about once in 15 or 20 attempts. So I find that it's quicker just to manually move the point in all three axes, using huge magnification. The point is correct in the in the Y and Z axes, but still needs to be moved slightly in the X axis. You can tell when the magnification is big enough because the tool handle gets huge.



12 **Here's the result** of closing up the end points on all the curves. At this point, I usually select all the curves and in either the Attribute Editor or the Display menu I turn on Show CVs. As you can see in the figure, the curves have different numbers of spans and run in different directions. Before using the Loft or Boundary tools, you must ensure that parallel curves have an equal number of spans and run in the same direction.



13 **To rebuild the** curves, choose the Edit Curves>Rebuild Curves option box. Rebuild type is uniform; Parameter range is 0 to #Spans; Keep Ends; and set the Number of spans to whatever is appropriate for the curve that you're rebuilding. Just make sure that the curve parallel to it is rebuilt to the same number of spans. Use Edit Curves>Reverse Curve Direction to make sure that all parallel curves run in the same direction. The screenshot shows the curves after they've been cleaned up.

14 **Working with the** preliminary curves, I've built the rest of the final curves for the entire car. I've colour-coded the curves so each colour represents what will eventually be a single mesh. Remember that each set of curves either contains four curves representing the four sides of the NURBS surface or else contains two parallel curves that will be lofted in a straight line.

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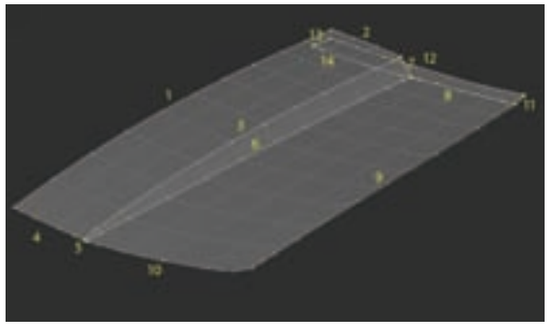
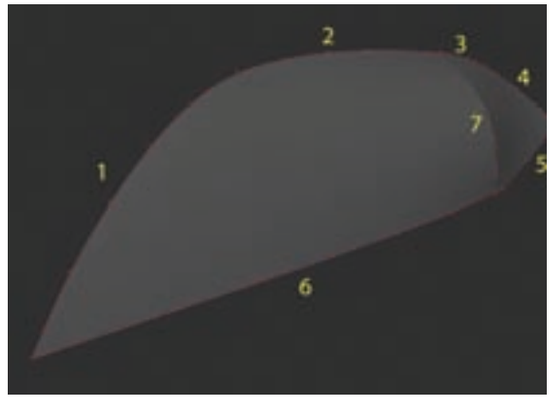
Filling it in

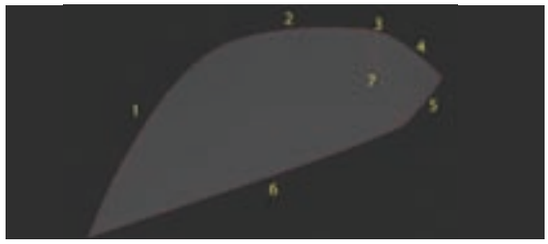
Building the NURBS surfaces



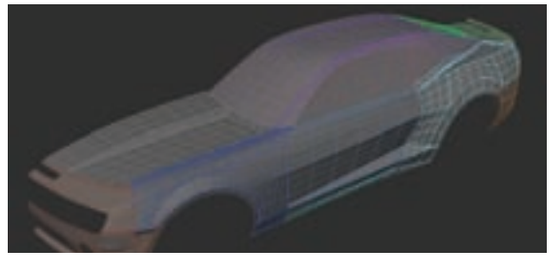
15 **Now we start** building the NURBS surfaces. The bonnet itself is made from three NURBS patches, and then there's a little skirt that sits between the bonnet and the windscreen made from a single surface. All of these surfaces were built using the Boundary tool. For the first patch, I selected curves 1, 2, 3 and 4 in that order. Choose Surfaces>Boundary with the default settings. The other surfaces are built from curves 3, 7, 6 and 5; from curves 6, 8, 9 and 10; and from curves 13, 12, 11 and 14.



16 **It's important to** leave the history connected to all of the NURBS surfaces. In this step, curve 7 is used to build the NURBS surface for both the front window (along with 1, 2 and 6) and the rear window (along with 3, 4 and 5). As you can see, this curve should be straight instead of curved.



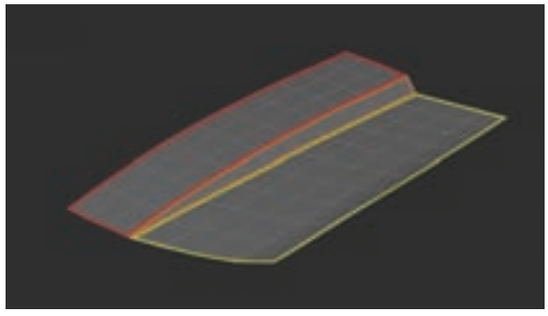
17 **The curve has** been straightened out here, and because the history for both windows was still connected, the shape of both windows was corrected by straightening a single curve. As you build the entire car body out of NURBS surfaces, you will find many surfaces that need to be corrected by tweaking the curves and many of these will share a common curve.



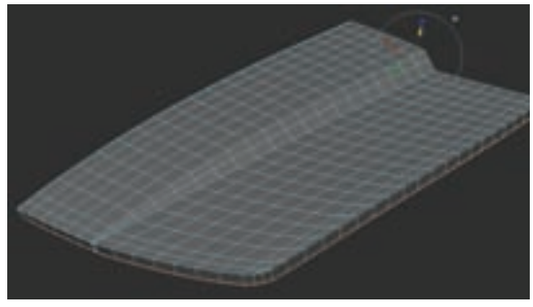
18 **Here, I've gone** ahead and built the rest of the NURBS surfaces that will make up the car body. Again, I have colour-coded each group of NURBS patches to represent the single mesh object that they will eventually form. Now we're starting to see a car!

Creating polygon elements

Converting the NURBS to polys



19 **Select each NURBS** surface and choose the Modify> Convert>NURBS to Polygons option box. The Type should be Quads and the Tessellation method should be General. Set both the U type and the V type to Per span # of isoparms. For a flat surface like the bonnet, set both numbers to 1; for a very curvy surface like the front bumper, use more resolution. This gives us three separate polygon meshes for the bonnet. These now need to be combined into a single mesh, and the vertices along the shared edges need to be merged.



20 **Where two body** panels meet, there is a seam between them. You want this seam to be visible in your model to help with the realism. Start by selecting all the border edges of your polygon mesh and extruding that edge inward perpendicular to the body surface. For body panels that need to be mirrored across the X axis, like the bonnet, the front and rear bumpers and the roof, you'll need to exclude the edges that run along the centre line from your selection and extrusion. I've exaggerated the extrusion here to make it more obvious.

Expert tip

Use bevels to hold your edges and corners when smoothing. These low-res meshes that we're creating are designed to be converted into smooth, high-res meshes using the Smooth function. One of the issues with this method is that it rounds off corners, even corners you wish to keep. We'll overcome this by running a bevel along every edge and corner we wish to hold. This works just as well if you're using the Sub-D method to smooth.

You can also do this by using the Insert Edge Loop tool to place a couple of edge loops right next to the desired edge, but this is an imprecise method. The Bevel tool allows you to make every bevel the exact same size on your entire model, giving you uniformity and consistency throughout, which is the sign of a 'model' professional.

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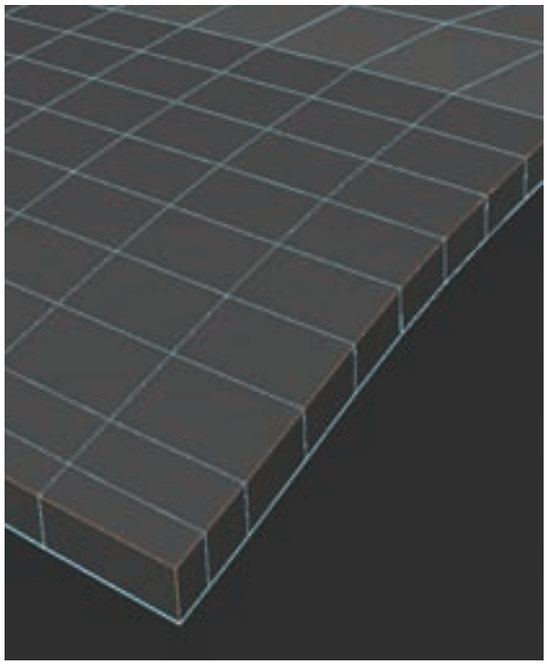
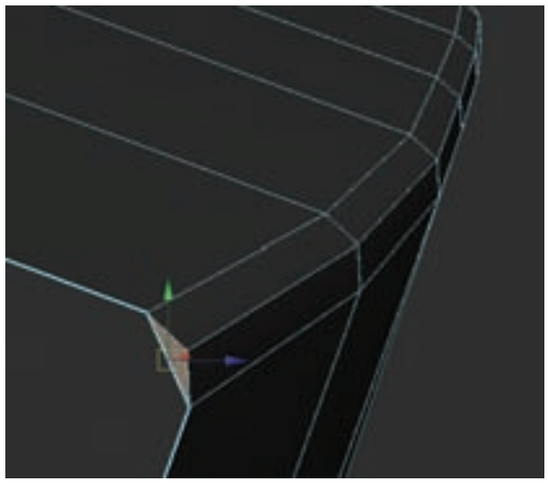
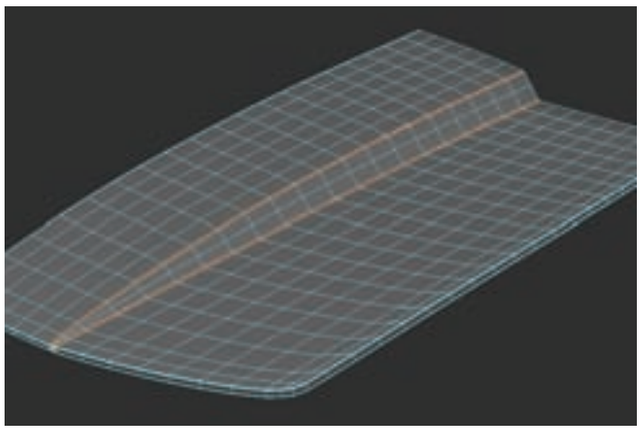


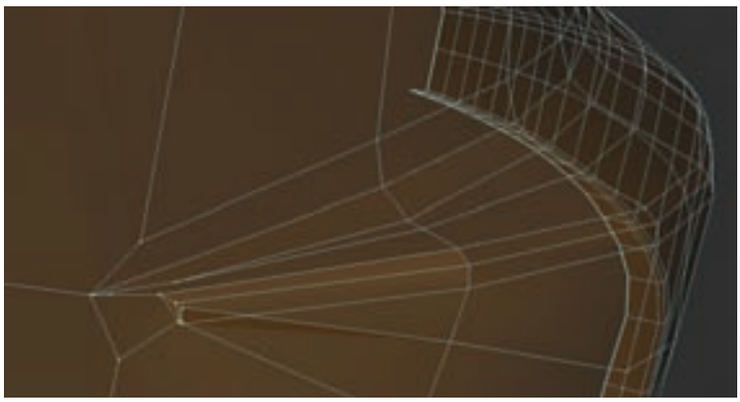
21 **Next, select the** same edges you selected for the extrusion, the former border edges. If your mesh has any sharp corners that you want to stay sharp, select the edge running along that as well. Choose the Edit Mesh>Bevel option box. Offset type should be Absolute so you can select a value that is the same on every edge on your model. Width depends on how large your model is and what type of world units you're using. My model is small enough to fit inside the grid in the perspective viewport, and I'm using millimetres as my world units so I used a value of 0.01. Segment should be two – this is the number of new faces that are created per edge. One will not be enough to hold your corner, while three or more just creates needless resolution when smoothing.



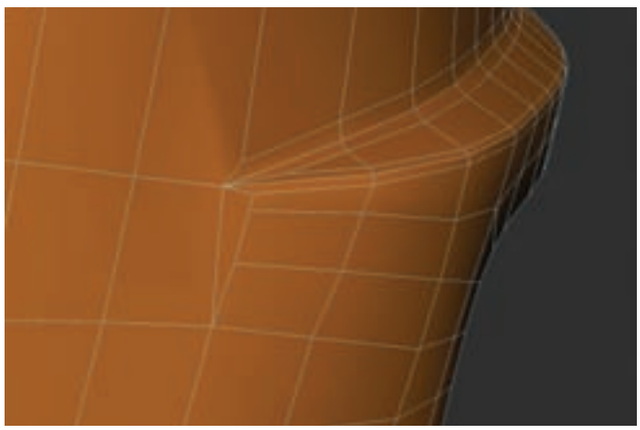
22 **This is crucial!** Every time you run a bevel that extends to the border edges, you will get an extra triangular-shaped face at the end of the bevel. You need to select and delete this face. If you don't, meshes that need to be mirrored across the X axis will never do this correctly. If you get a weird mirror or your vertices along the centre line don't merge properly, check to see if this is your culprit.



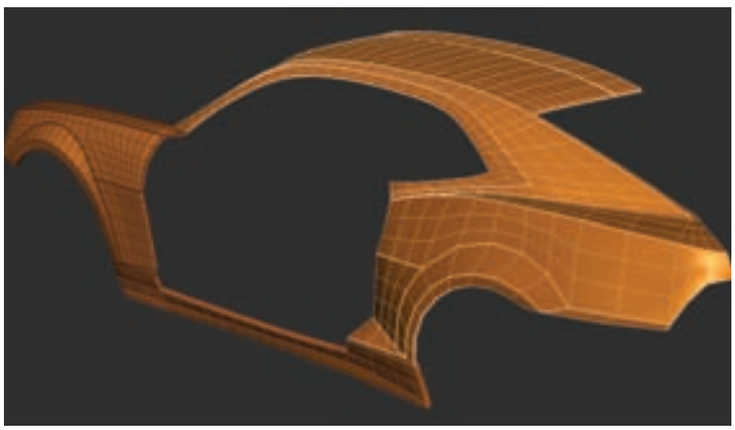
23 **Finally, you need** to select and bevel all the edges in your mesh that will be creases in the body panel. I generally set the width for these bevels to a value twice as large as the bevels that run along the seams, as I want the creases softer and the seams sharper.



24 **One of the** benefits of using NURBS patches to build your meshes is that you wind up with great topology. This helps when bevelling because the Bevel tool hates poles (vertices with five or more intersecting edges) and intersecting edges that are at acute angles. But no matter how well you plan out your curves and the resulting NURBS surfaces, sometimes you're going to end up with bevels that have really wonky results.



25 **The previous step's** screenshot is an example so bad that I had to use the X-Ray shading mode to display all the vertices, because some were buried behind others. In those cases, you'll have to go in and reposition the vertices by hand. The screenshot here shows the rebuilt result.



26 **In examining the** photo of the Camaro, I noticed that the roof and the rear wing were one solid piece and that parts of the current front and rear wing should be included in the rocker panel. So I cut the meshes apart and reassembled them in a new order. The screenshot shows the three reconfigured meshes, including seams and creases.

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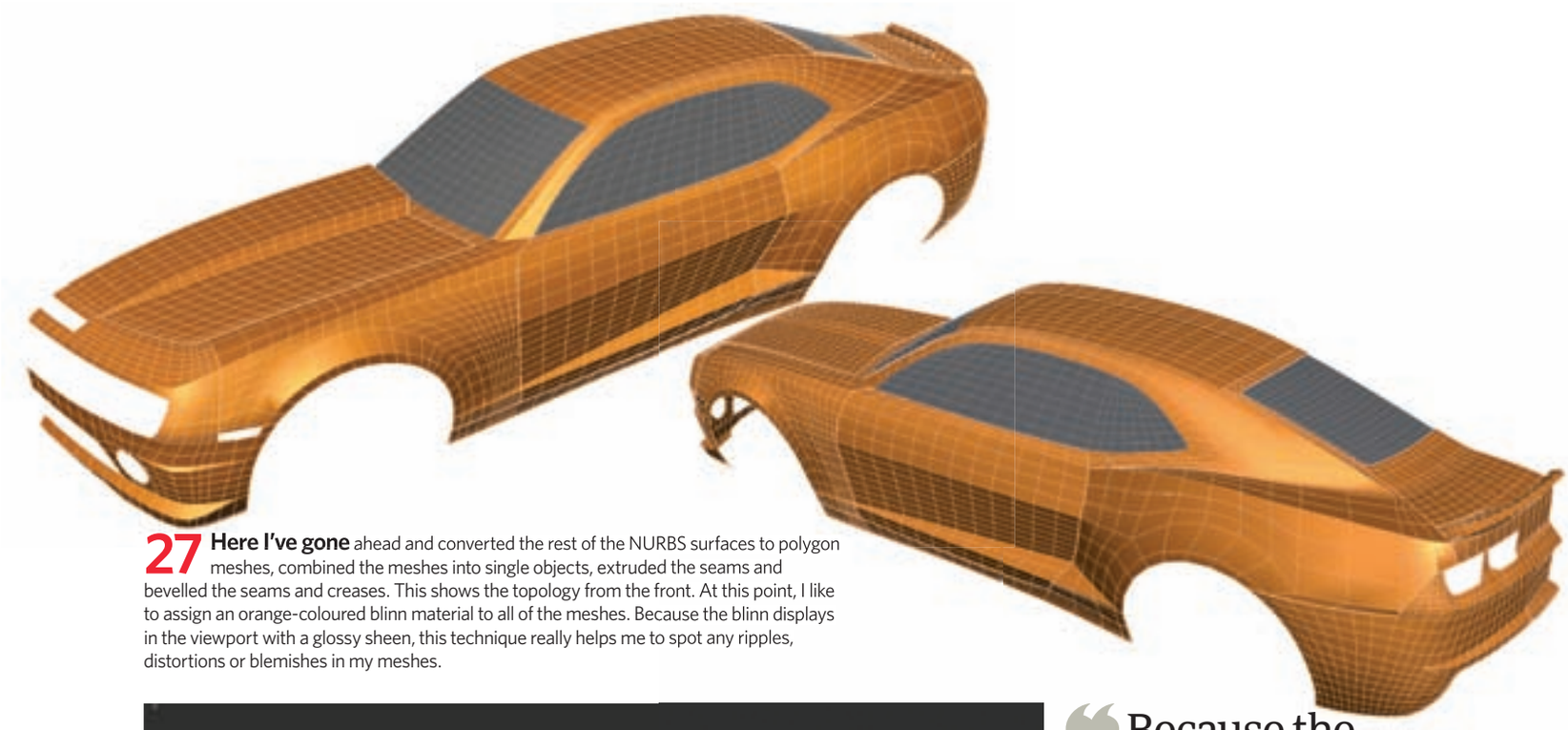
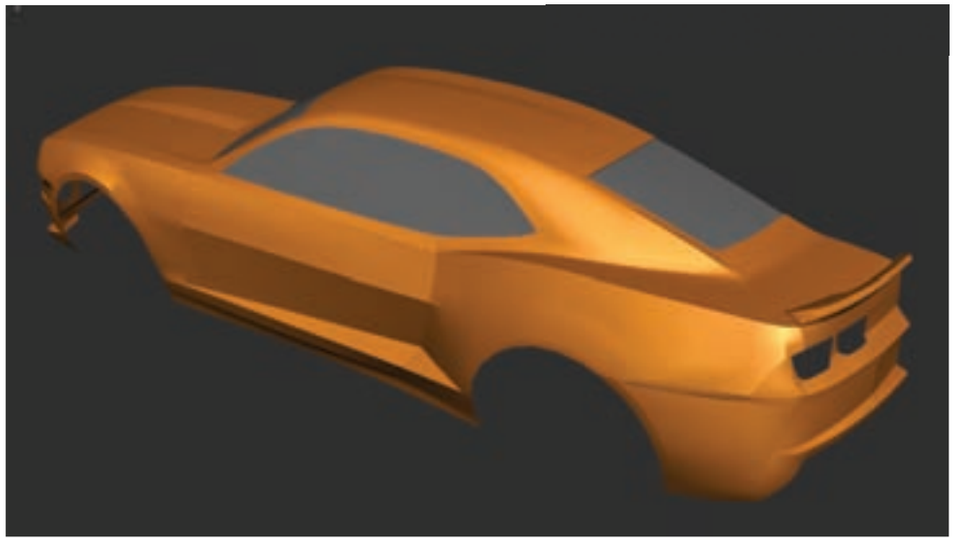


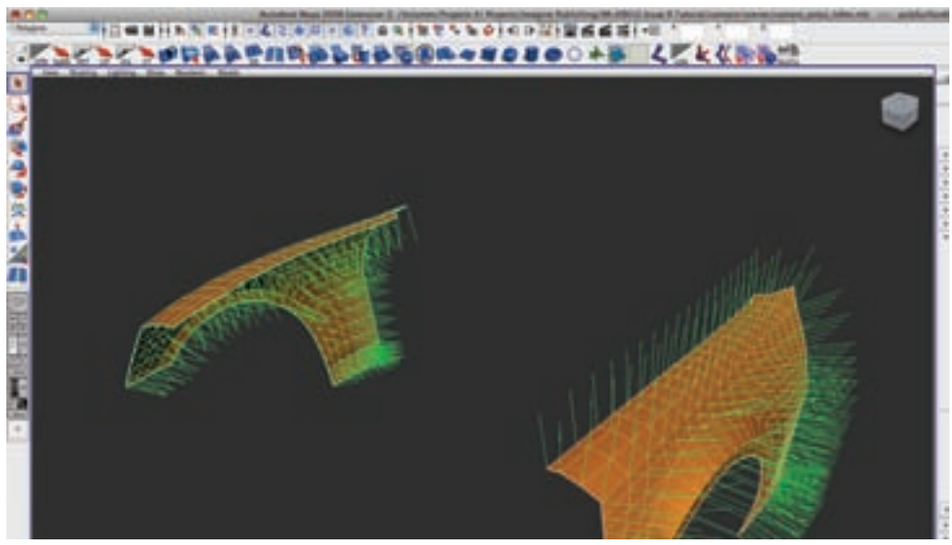
27 **Here I've gone** ahead and converted the rest of the NURBS surfaces to polygon meshes, combined the meshes into single objects, extruded the seams and bevelled the seams and creases. This shows the topology from the front. At this point, I like to assign an orange-coloured blinn material to all of the meshes. Because the blinn displays in the viewport with a glossy sheen, this technique really helps me to spot any ripples, distortions or blemishes in my meshes.



> "Because the blinn displays in the viewport with a glossy sheen, this helps to spot any ripples, distortions or blemishes"

28 **The screenshot shows** the topology of the polygon meshes from the rear without the wireframe. The body panels are not as smooth as we would like yet, but that will happen during the final smoothing process.

29 **The last step** in preparing the low-res polygon meshes for the smoothing process is to mirror the bonnet, the roof, the front and rear bumpers, the front and rear windscreens and the hatchback across the X axis, combine the meshes and merge the centre line vertices. Objects such as the wings, rocker panels and doors will also be mirrored but not combined. If you mirror objects such as doors and wings by duplicating the mesh and then set the scale transform to -1 across the X axis, you need to go one step further. When you freeze the transforms to zero out the Scale X, you will get the following message: Warning: Freeze transform with negative scale will set the 'opposite' attribute for these nodes. What this does is to set your normals to the wrong direction. To fix this, you need to open the Attribute Editor, open the Render Stats tab and uncheck Double Sided. This will expose the Opposite attribute, which you will uncheck. Now recheck the Double-Sided attribute. Finally, you will need to choose Normals>Reverse to complete this step.



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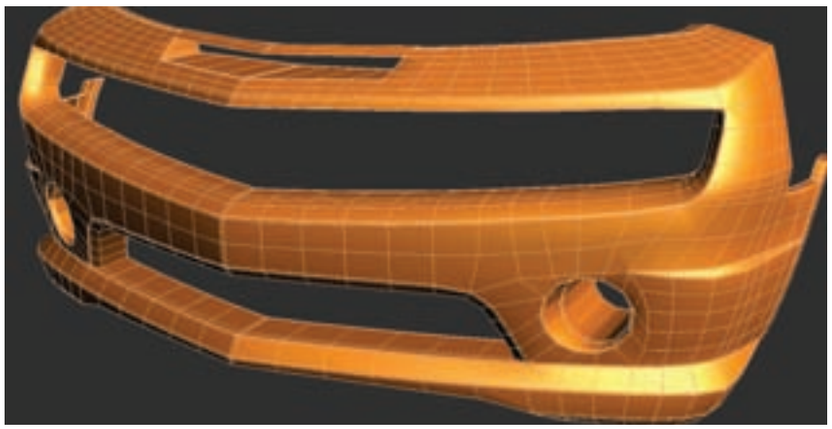
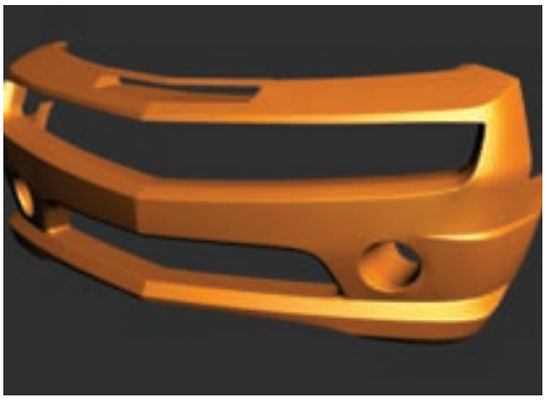
Finishing up

Smoothing the poly meshes



30 Here is where all of the hard work will pay off. As I said, these low-res polygon meshes were designed to be smoothed into the final high-res meshes. We'll use the front bumper here so that we can really see the effect of the final smoothing. Notice the bevels that we'll use to hold the seams, creases and corners. This step shows the mesh.



31 With the mesh selected, choose the Mesh>Smooth option box. I used two levels of divisions to really smooth it out, and I turned off Preserve: Geometry Border to ensure all the borders are smoothed as well. The result is shown with the wireframe turned off.

32 And here's the result. The polygon count jumped from 2,458 for the low-res version to 39,378 for the high-res version. In the non-wireframe image, you can really see how flawless the surfaces are. No ripples, no distortions, no blemishes. Notice how well the bevels held all of the seams, creases and corners. You can also tell here how well the orange blinn material helps to really show whether the surface is smooth or blemished.

33 After smoothing all of the low-res meshes and mirroring the necessary objects, we now have all the bodywork for the Camaro completed. Thanks to the NURBS surfaces we formed from those curves that were so tedious to build, we now have body panels that are perfectly smooth. Thanks to our use of bevels, all of the seams are of consistent size and the creases maintain a consistent size as they run down the length of the car across several body panels.

34 Here are a couple shots showing the rear view of the Camaro, with and without the wireframe.

NEXT MONTH

Now that we have got the body panels finished, the hardest part is out of the way. Next month we will model the rest of the Camaro, which will include the grill, the head and rear lights, all of the trim, the wheels and tyres, as well as the interior of the car. We will create textures and shading networks for all of the materials. We will UV-map the objects that require it. Additionally, we will set up a studio lighting rig to bring out the best in our work.

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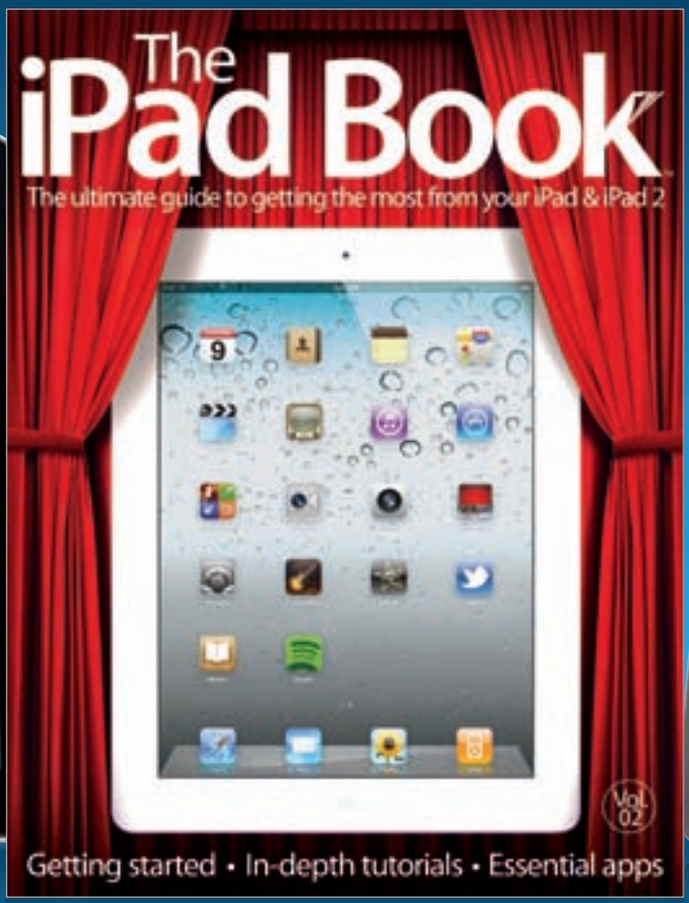
Learn in style

iPad


The
iPad Book
The ultimate guide to getting the most from your iPad & iPad 2
Getting started • In-depth tutorials • Essential apps
Vol 02

Printed full colour large format book

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I made this...

Incredible 3D artists take us behind their artwork

Artist info

Artur Gruszka

3DArtistonline

Username: grooshka

Country Poland

Software used LightWave, ZBrush, Photoshop

The render was done in LightWave. I rendered three layers of the image separately: the characters and the background of the old bookshelf. I used a brand-new Fiber plug-in from LightWave 9.5 to create the fur on the doctor's dressing gown. The entire rendering took about 20 hours at A4 (300dpi). The deadline for the contest was approaching fast, so I had to overpaint details in Photoshop.

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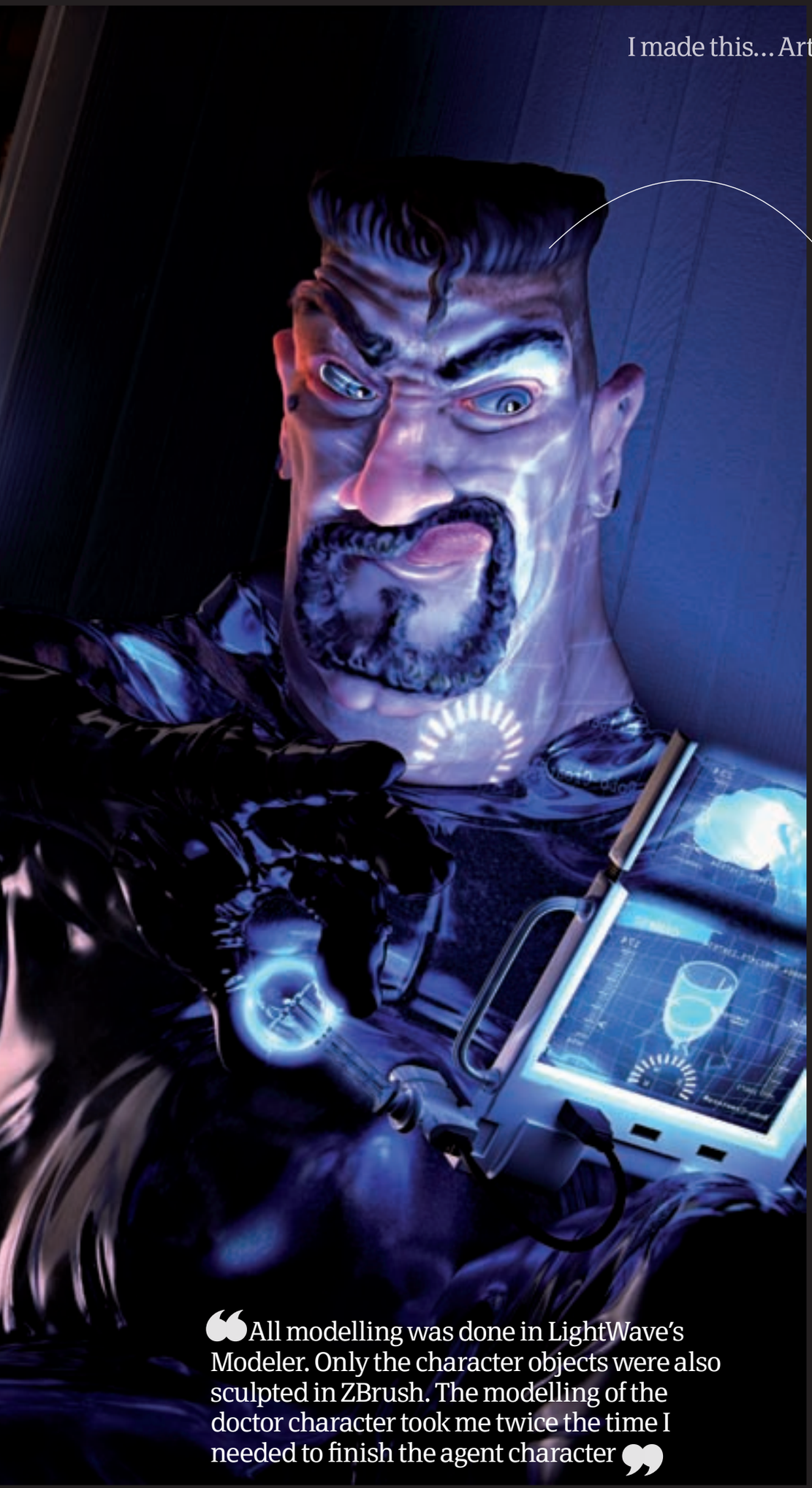

We're always trying to get renders to look like the shots we get from DSLRs, so the same rules apply. However, in this particular image, the foreground and background had to be without depth of field because of the details I wanted to preserve. I decided to reduce this unnatural look using lighting, so the cold foreground makes a distinct cutoff from the warm background. The lighting fitted well to show the personalities of the characters.

Famous attempt on Doc Hilary's life 2009

The image was made for CGSociety's Secret Agent CGChallenge. Brief research on the topic brought me to some cliched images with beautiful agents, extremely tough-looking bosses as assassination targets and guns, guns, guns and lots of guns. I knew I had to make my image look different. So I came to this idea of a fat agent and a rather innocent-looking gentleman as the target of his sick effort. The picture tries to depict the secret agent in his mad attempt on Doctor Hilary's life. He finds the doctor sitting in his armchair, reading a book and drinking wine. It's the right moment for the agent to activate his robot friend who could easily slip into the room unnoticed and drop few drops of poison to his drink. He's controlling the bot from a safe distance.

> "All modelling was done in LightWave's Modeler. Only the character objects were also sculpted in ZBrush. The modelling of the doctor character took me twice the time I needed to finish the agent character"

Software used in this piece

LightWave · ZBrush · Photoshop

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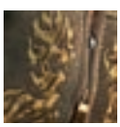
Step by step: Create a female tomb raider

Dungeon Warrior 2009

> Create an atmospheric, subterranean image with a slender female warrior

Paul Francis is currently working as a lead artist

I'm a classically trained artist, but over time I found that when it came to CG I had begun to forget the basic rules and my work was getting weaker. This was an attempt to reverse that trend. I wanted to produce an image that demonstrated the importance of tonal value and to use chiaroscuro to enhance the effect of 3D volume. I used to be a real-world modeller in special effects at Shepperton Studios, but despite that I find modelling anything but the simplest of things on a PC just gives me a headache, so I started using Poser a while back and this image is entirely made up of commercially bought elements. It's not everyone's cup of tea, but it's a quick and effective way to produce a lot of work. The trick is to make it look different to all of the other badly lit out-of-the-box Poser stuff out there. The Firefly render engine within Poser is a revelation to me now that I have learnt to use it properly, as I really like the soft, illustration-like images it can produce but, as ever, the correct lighting is absolutely crucial to getting an acceptable final image.



Design concepts

Rough ideas for designing the model

01 I began with good old Victoria with some custom morphs applied (the excellent Yaara by Aery Soul Studios). In my mind I had a picture of a female figure in a resolute, powerful pose. Using the figure with minimal props speeds up this stage immensely while you get the composition, pose, camera angle and lighting right.

02 Initially, I wanted to have the figure emerging from a doorway at the top of a Mayan-style pyramid temple at sunset. As Poser doesn't have any modelling tools at all, I used bits and pieces from various models I already had, in much the same way as you would use scraps from physical model kits.

03 I realised that my original concept wasn't really going to work; if the figure was lit for the outdoors, the background details and light spill from the sky would destroy the chiaroscuro effect I was going for. So I used the model elements I had to construct a closed set, and a test render showed that it worked much better.

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Composition, Lighting, Rendering

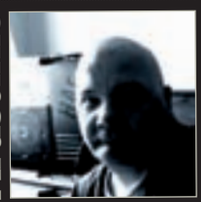
Software used in this piece

Poser Photoshop

Step by step

Easy-to-follow guides take you from concept to the final render

Artist info



Paul Francis

3DArtistonline
Username StormdrainGFX

Personal portfolio site http://paul-francis.cgsociety.org/gallery/
Country England
Software used Poser, Photoshop
Expertise Figure work, landscapes, visualisation

> “Using the figure with minimal props speeds up this stage immensely while you get the composition, pose, camera angle and lighting right”

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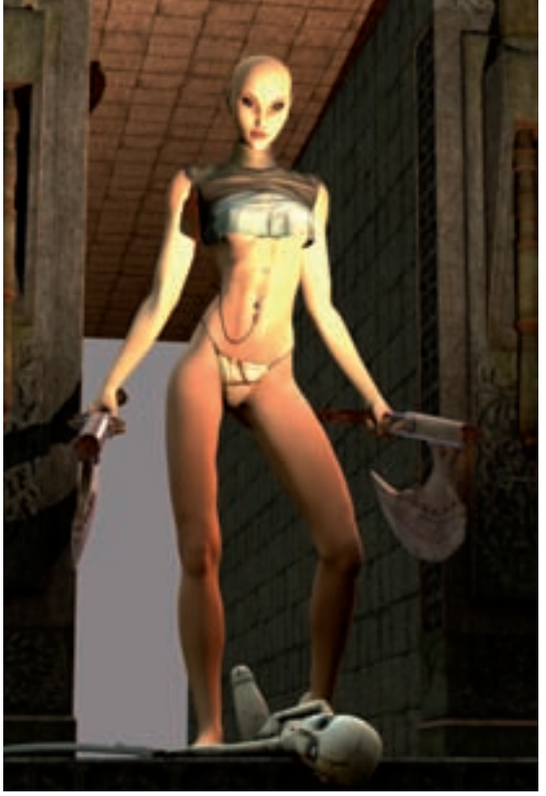
Character construction

How the elements were put together

04 The next step was to give some foreground interest or the main figure would just be staring vacantly into space, which is a common mistake that is often made with Poser. I had this creepy doll model that I just had to use, which renders really well.



05 Next, I had to get the camera angle right. I used to be a photographer and tend to apply what I learnt in that field to 3D. Although this screenshot shows a strong relationship between the foreground and the main figure, I wanted a longer focal length to add solidity to the main figure.

06 This is the final camera angle and composition, with quite a long focal length on the camera. This has the effect of making the main figure more massive in relation to the foreground figure, which otherwise might dominate the picture; a simple but effective device – ask Steven Spielberg!

07 The next stages are to add in the detail on the character. If I was a modeller, this would take me weeks, but thanks to the range of commercially available models it can be much quicker, and is a godsend if you get a rush commission. I've loaded up a load of fantasy clothing and hair here.

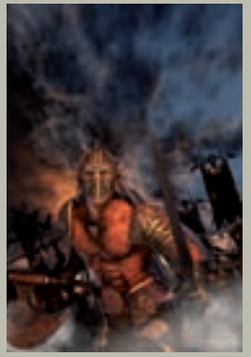
08 My favourite bit – greebles and nurnies! The floor in the foreground is far too bare, so it needs some detailing in there to break up the surface and add visual interest. Fortunately, I have some broken-up bits of rubble and stuff that I keep for just this purpose, so I've scattered a few instances of it around.

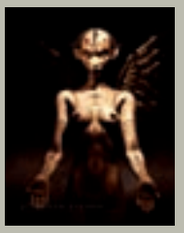
Artist Showcase

Paul Francis

I have a degree in Fine Art as a landscape painter. I've been making CG imagery since about 1998. I used to be an SFX model maker (*Red Dwarf,* etc) as well as a photographer. It has all given me a pretty solid grounding in what makes a good computer-generated picture.

Barbarian
Poser, Photoshop, Vue (2009)
This was used as the box art for a new trading card game called Time Wars. Being able to isolate the Poser figures from the Vue background meant it could be die-cut to stand up as part of the point-of-sale packaging, so it's now real 3D!





Stigmata Eterna **Poser, Bryce, Photoshop (2008)**
The first picture where I bit the bullet and got to work on a basic 3D render with Photoshop. I had previously been a die-hard 'it has to be rendered in one go' fundamentalist; all I can say is that I'm now selling work whereas I wasn't previously!

This One's Still Alive
Poser, Photoshop (2009)
This shows what can happen if Photoshop brushes take over your life... this had multiple masks to isolate the figures from each other as well as the background; there's about seven FX layers, apart from the different treatment of the figures within each layer. Part of the Time Wars TCG set

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Lighting and rendering

Put the final touches in place

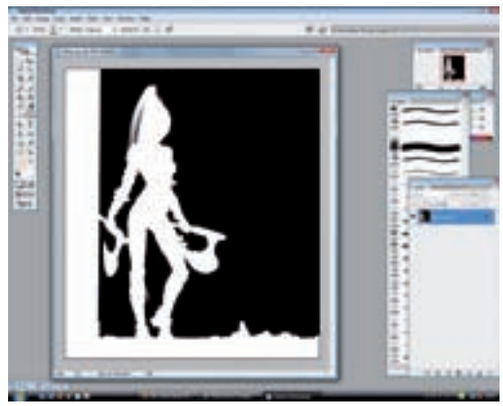
09 **The hardest part** of all with Poser – getting the lighting right. In this case, I've used four lights: an image-based light to provide overall illumination, a Rim light to help define the character against the background, a Specular light to pick out texture detail and a warm Spot light.

4hours **render time** Resolution: 2642 x 3000

10 **The final render** from Poser. This is as it comes out of the Firefly render engine, and it's not looking too bad. The shaded areas really help to make the lit areas stand out and give the whole composition some depth, which is what I was after.

Making a mask in Poser

Producing a mask in Poser... the only way I am aware of is to cheat! I deleted all the lights then produced a low-quality render. This is then exported as a PNG to Photoshop where the whole image is darkened and the contrast boosted, both to the maximum. As the background is transparent it isn't affected, and a new white layer can then be dropped in behind. The whole thing is then merged and converted to a negative image. A bit long winded but it works, and a mask is essential for postproduction effects work or compositing Poser renders.



11 **I then produced** a mask in Poser (see the boxout for how to achieve this). The mask is then used in Photoshop to isolate the foreground elements of the Poser render from the background, which means I can paint separate effects behind and in front of the figures, taking control of individual elements.

12 **Here, I added** smoke behind the figure as well as in front, and will add the light rays next. These were painted by hand as well as using some FX brushes I've built up over the years. The transparency had a bit of tweaking done to make it more subtle, too.

13 **In the final** stages, I decided to darken down the background around the edges. To give it more depth and to make it less distracting, use the Burn brush. The final step is to merge all the layers and make a slight adjustment to the colour balance to warm it up.

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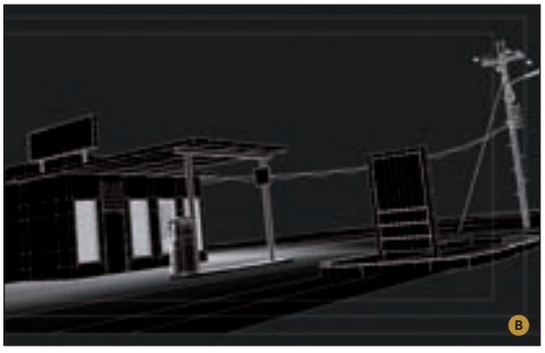

Concept

A The concept behind the picture is to show loneliness and a set of obstacles that are hindering the driver's way. To bring this idea to life, I used all possible means to define the objects, style and mood.

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Create a rainy and windswept service station

Lonely Driver 2008

> In this work I wanted to obtain the maximum realism and dramatic nature to show emptiness around the driver

Andrei Kashkin is a freelance 3D artist

The idea of creating a highly detailed image of a car on a road had been in my mind for a long time. So when I had some free time, I started to work at once. First of all, in any artwork the aim is to portray the idea and mood. Just the mood creation by making atmospheric effects was the work's most interesting and most difficult part at the same time. *Lonely Driver* is the result of my experiment. The main task of the project was to use many programs, plug-ins and styles of work to improve my skills. One requirement that I put to myself was to make a scene that's possible to animate. I used 3ds Max and Photoshop as the main software for creating the work, as well as Vue xStream, the AfterBurn and Onyx Storm plug-ins and V-Ray. I have tried to pay attention to each creative part of the piece and will tell you about some of the difficulties that I faced and decisions that were made along the way, as well as mentioning any special features during the project. Hopefully, you will draw something interesting from this article for yourself!

behind the scenes

3D artists explain the techniques behind their amazing artwork

Modelling, Lighting Texturing

Software used in this piece

Photoshop · 3ds Max · Vue

Artist info

Andrei Kashkin

Personal portfolio site http://xmyth.cgsociety.org/

Country Ukraine

Software used 3ds Max, Photoshop, Vue

Expertise Andrei specialises in the conceptual design of environment modelling, lighting and texturing

01 Inspiration

I was inspired by watching a film in which the main character was rushing down the motorway in heavy rain. It was a beautiful feeling of loneliness at the time, and I understood at that moment that I wanted to create the same feeling in my own artwork. The next step is to define the style of the image.

B Eighties cafe with petrol station

C Some image details. The objects were the last to be added

02 Image style and composition

The environment represents a desert with unpredictable weather and bleak surroundings. As many details as possible helped to underline this, such as dry grass, road signs indicating the long distances to nearby cities, an old Eighties cafe, while the road stretches into the distance. I was guided by classical rules of photography during the creation of the composition and camera setup.

03 Details and references

In my mind, I had already imagined the picture, composition and mood, but attention still needed to be paid to the details. In my artwork, I always use references from the internet or other useful sources. It is very easy to spoil a picture with unnecessary details and textures. Therefore, very careful work is a necessity at this stage.

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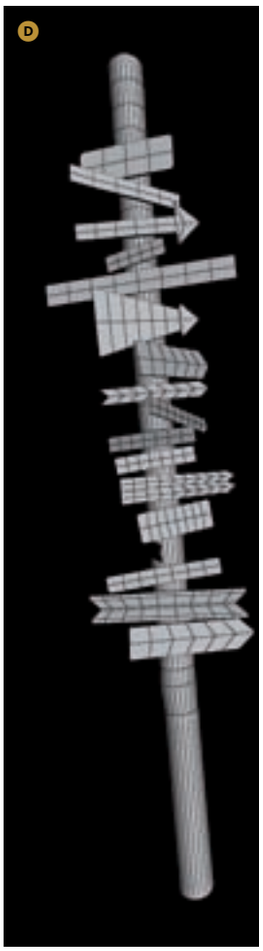
Model the scene

Modelling with a rough model



D

04 Start modelling

I start to model the main objects from primitives, such as boxes, planes, cylinders, etc. Then they were converted to editable polys and edited using Edit Geometry commands like Slice Plane, Cut, Weld, Chamfer, Connect and others. To achieve a natural look for the man-made objects, I applied chamfers along their corners and either altered the vertices manually or using the Noise modifier.

05 Model the cafe

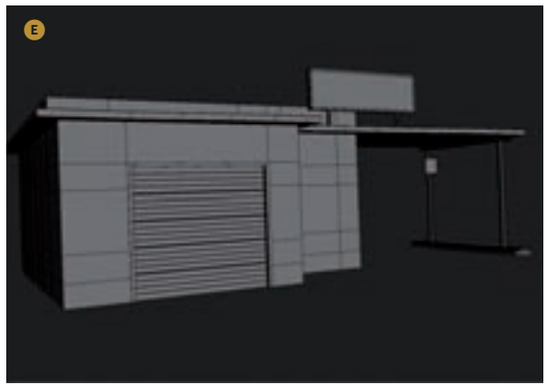
The cafe is a simple model, so only basic attention was given to its form. The screenshot shows the entrance door, some windows and the garage door from a side angle. The cafe's roof covers the petrol station, too. A Noise modifier was applied for the whole model. Within the cafe are low-poly tables and sofas.

06 Model the car

The car is a very basic object in the scene that's made in high detail. I started from a plane and gradually added new polygons, checking its position in the 3D space. It is practically impossible to make out the quality of miniature elements from such a distance, so it's only important to include the basic details; here. I worked quickly without attempting to get the perfect car shape.

07 Model the pylons

It was difficult to choose an example of a pylon in the desert, as there were lots of references. As you can see, most of the details on pylons are very simple. They were modelled from primitives, while the wires were made by splines. For realism, each pylon is inclined and has unique details, such as the lantern and dowels on the sides.



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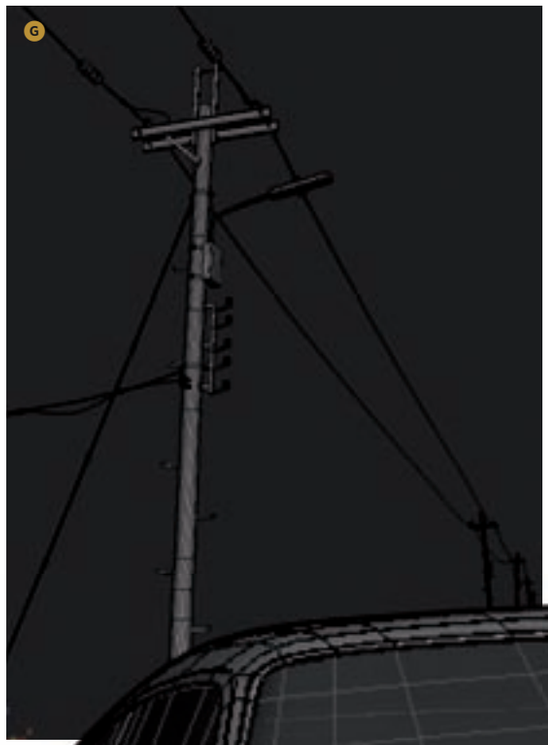

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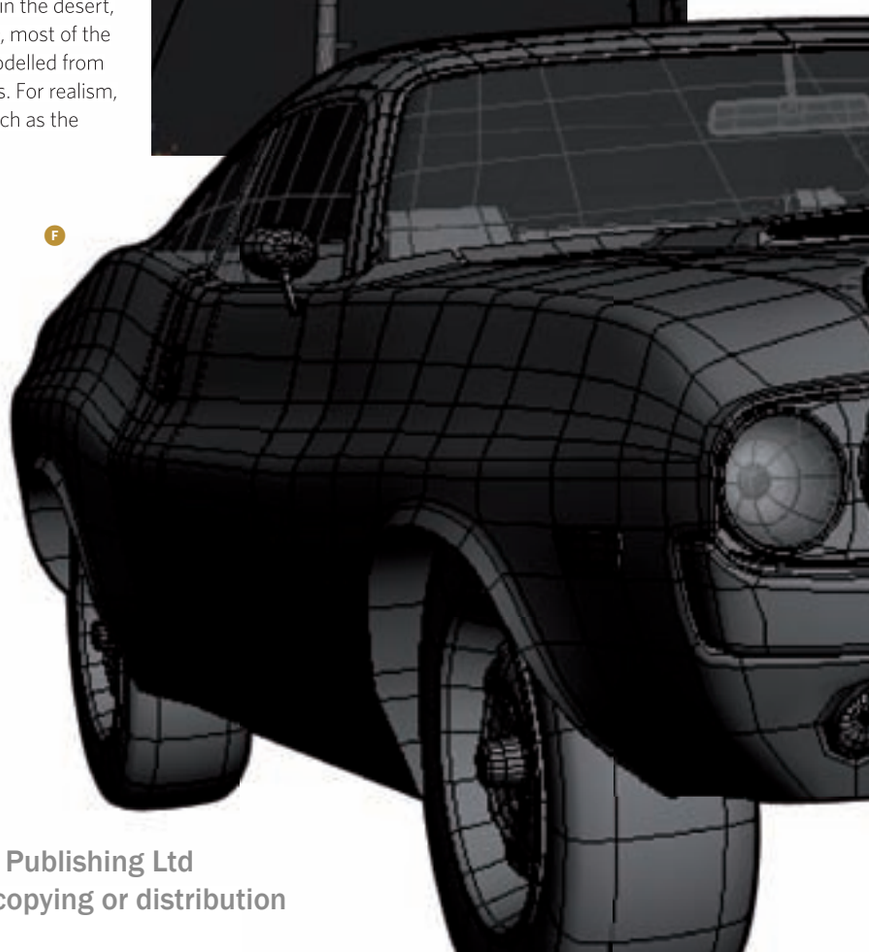

F

D Wooden pole and signs with manually altered vertices

E Complete cafe model

F Complete model of the car

G The inclined pylons along the road

Create a desert environment

For me, modelling is the most boring part of the work as there's very little in terms of creativity going on. A heavy scene needs to have an economical polygon count as long as it's not to the detriment of the image's quality.

I began work without any sketches, adhering to the rule of modelling the main objects in low quality to begin with, and gradually adding details to make them look nice. As the car is at the centre of the composition, it was modelled in high detail.

Almost all of the objects in the scene were made from primitives that were converted to editable polygons and then edited. Hot keys are useful in speeding up the modelling process.

The most interesting part of the modelling in this work is the creation of vegetation. Two programs – Vue and the Tree Storm plug-in – were used for this. Exported paths of grass from Vue were multiplied in the distance with the Adv Painter script.

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Add scene details

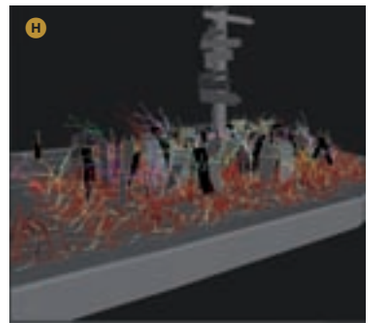
Bring a bit of interest to the scene

08 Make the vegetation

In order to create some vegetation in the distance, patches of grass were exported from Vue. For the grass arrangement I used the Adv Painter script, using different options for Rotate, Inclination and Scale. Other types of dry grass near the wooden pole were made from planes with grass texture (alpha). A third type of grass were models from Onyx's Tree Storm plug-in.

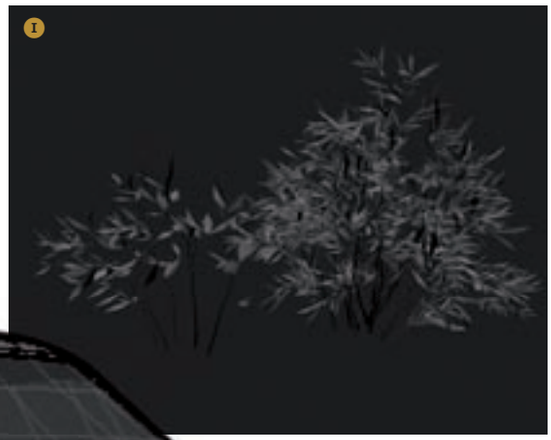
09 Make bushes

The bushes were created using Onyx's Tree Storm again. This plug-in creates an even animation of plants under the influence of wind. I made different types of bushes, changing the parameters of the standard presets. Instead of creating a diffuse bitmap texture for this, I chose a Noise material with different shades of green.



H Different types of vegetation (Vue patches on the left, and Tree Storm/ hand-modelled vegetation on the right)

I Bushes near the road

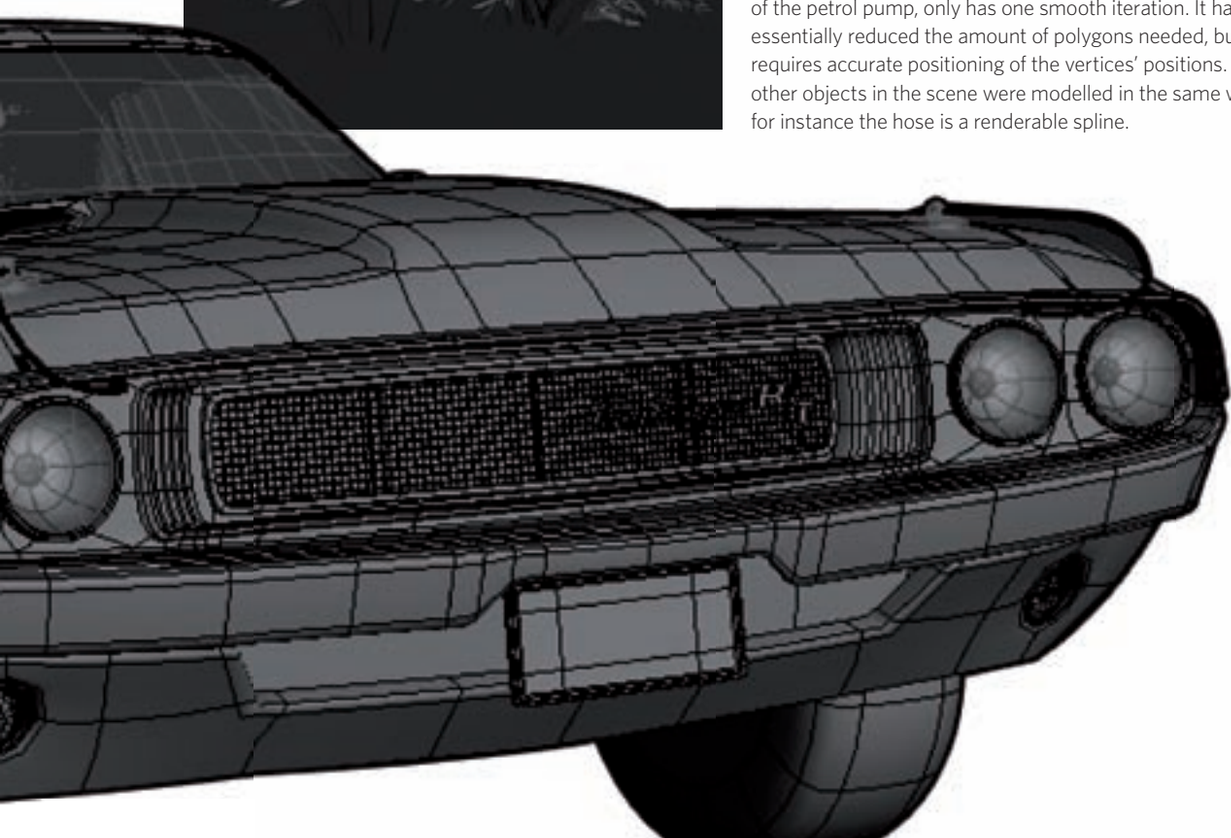


10 Make grass sprout from cracks

On the right-hand side of the road, you can see grass blades sprouting from cracks. This grass was modelled manually from primitives (three to four different types of blades). I drew splines on the displacement structure and multiplied the blades using the Scatter function (this can be found in the Compound object menu).

11 Model the petrol pump

The MeshSmooth modifier, which was applied to the mesh of the petrol pump, only has one smooth iteration. It has essentially reduced the amount of polygons needed, but it requires accurate positioning of the vertices' positions. Some other objects in the scene were modelled in the same way, for instance the hose is a renderable spline.



Texturing and postproduction

Most of the objects were mapped using the UVW Map modifier with box, plane or cylinder mapping. More difficult meshes, such as the car or the main objects in the cafe, were mapped with Unwrap UVW.

Texturing in the scene started with the cafe (followed by the asphalt), as it occupies a big area on the picture. Always start texturing the objects that occupy the most space. If you don't have enough time, it is possible to apply similar textures and materials that you made earlier to small objects. It will also save on your computer's resources and accelerate the rendering. It is recommended to do textures with a resolution of 256px, 512px, 1,024px, etc, on height and width.

The final step during the creation of a still image is the postproduction work. Before this, I have three images from render: the main scene, fog and rain passes, saved in 48-bit PNG files with alpha channels. I chose Adobe Photoshop to finish off the artwork. Brightness/Contrast, Color Balance and Hue/Saturation were changed for each layer separately. I then merged layers with different opacities and blending parameters.

J Manually modelled grass arranged on the splines by Scatter

K The old petrol pump only has one smooth iteration

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Artist Showcase

Andrei Kashkin

I was born in Kharkiv, Ukraine in 1988, where I currently live. I have been a student for about five years now, teaching myself 3ds Max. My style in 3D art aims to express feelings by the means of everyday objects surrounding us, as well as to show the problems that get mankind worked up.

Venice **3ds Max, Photoshop, V-Ray (2007)**
The idea to create the artwork came about when I looked through some photos of Italy. This one shows a Venice morning

Water Force **3ds Max, Photoshop, V-Ray (2008)**
In this picture, you can see the corridor of a submarine that is collapsing. Water will fill it in a matter of seconds...

5th sector **3ds Max, 3ds Max, Photoshop, V-Ray (2008)**
This is a post-apocalypse situation with a real stadium, which is situated in my native city. The group of people, located in sector five, resist with misfortune

14 Asphalt materials

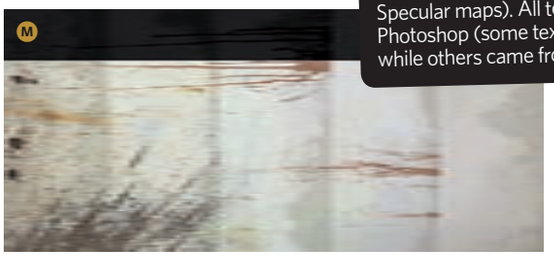
It's necessary to give special attention to the wet asphalt, as there were two types used in the scene. As a basis I took materials from www.vraymaterials.de, but they did need to be altered in order to achieve nice results in the conditions of the given illumination. Cracks on the road were made by displacing the texture with cracks.

Add the textures

Make textures from gallery photos

Textures

Bitmaps were made for almost all of the objects – there were over 90 in the scene (including Alpha, Bump and Specular maps). All textures were made from photos in Photoshop (some textures were from CGTextures.com, while others came from pictures found on the internet).



L Final diffuse texture of cafe wall

M Different type of textures for one material of the garage door

12 Texture the cafe wall

The basis of the wall texture was taken from the photo. I added some new layers of cracks and plaster above from other photos. It is important that the colour balance is identical in different layers, otherwise colour correction or Hue/Saturation has to be applied for correction. The Burn tool was used on corners and some other places to create dirt. The Clone Stamp tool is very useful to eliminate unnecessary details on the canvas and sharp transitions between different layers. Sometimes I mix layers in the Multiply or Overlay mode for leaks and dirt.

N Preview of asphalt materials from Material Editor window

O Nodes of procedural asphalt

13 Texture the garage door

The diffuse texture is only one part of the materials. Most of the materials were made as VRayMtl shaders with Diffuse, Bump and Reflection maps. A Specular bitmap of garage door was created from the diffuse bitmap. All the layers were desaturated and mixed with different options. For some Bump maps, I used Noise or Smoke Procedural maps or a combination in a Mixed map.

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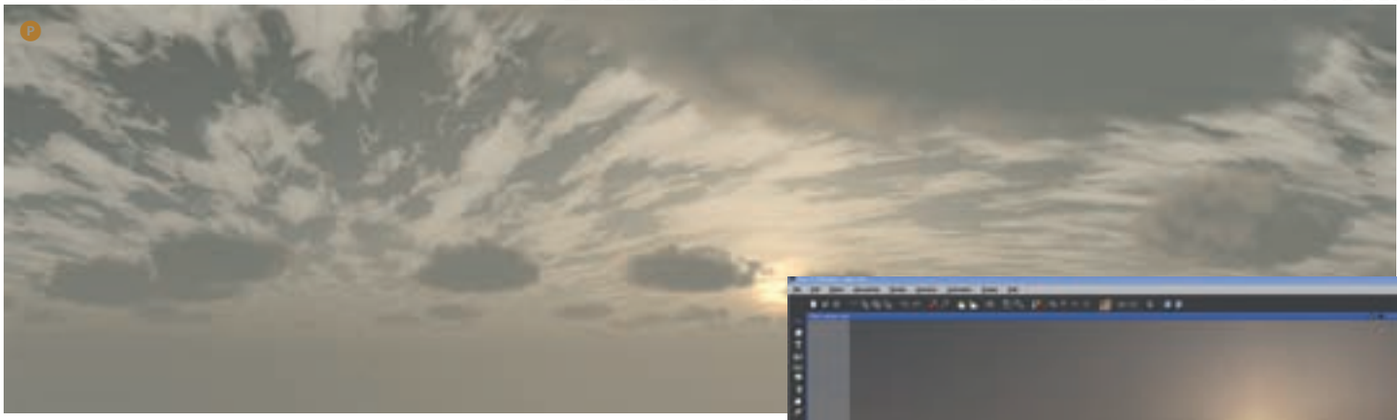
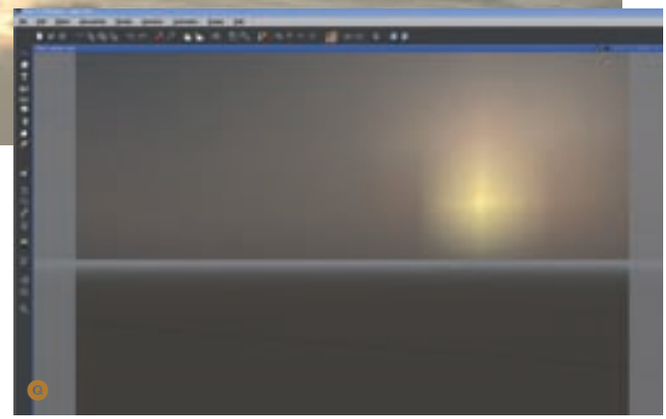




15 Light the scene

The main source of illumination is an HDR sky that was made in Vue. Two V-Ray light sources were also used for illuminating the scene. These were V-Ray's Plane light inside the building and V-Ray's Dome light for the whole scene. I left their colours white because the basic tone was set by the colour of the HDR texture and colour correction could be done in postproduction.

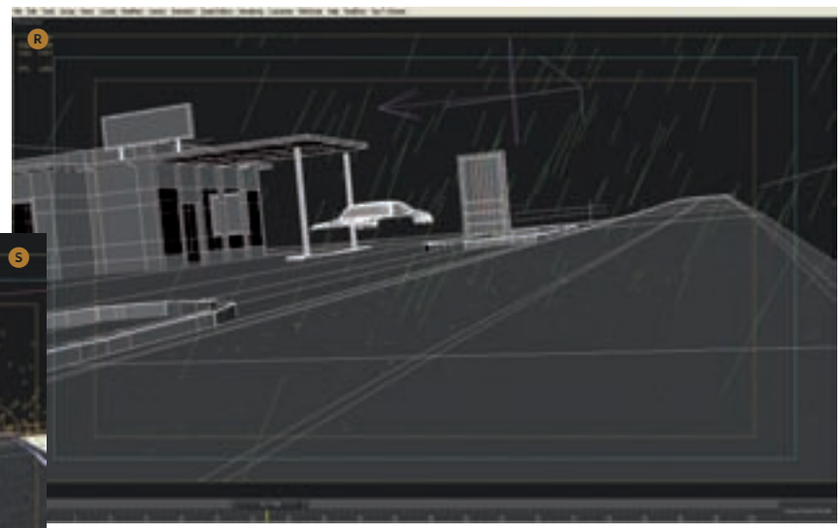
P A part of rendered HDR texture for lighting

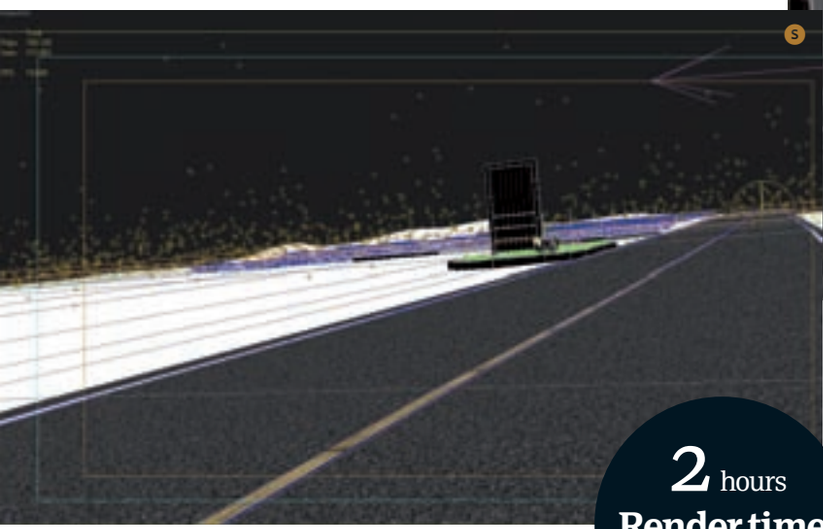
Q Vue viewport with the sky

R Rain with forces and UOmniFlect deflector

16 HDR sky

To create an HDR sky, an atmosphere was loaded in Vue from a standard collection. I wanted the sun to be behind the clouds and close to horizon line so that the scene was illuminated with soft shadows. All the necessary parameters were set in the Atmosphere editor. When I achieved some nice results, I exported the sky in an HDR file.





S The fog is concentrated near the ground

T Pure render without fog, rain and postprocessing

2 hours
Render time
Resolution: 3,388 x 1,542

17 Rain creation

The rain was made using 3ds Max's Particle Flow. A drip system was bound with gravitation and wind force. All parameters of the forces were set experimentally. For the splash deflector, I used the UOmniFlect deflector containing the objects in the scene in low quality without small details (to decrease the count of polygons in the deflector). The rain consisted of 5,000-7,000 droplets, which were rendered as spheres with motion blur in a separate pass.

18 Fog creation

Fog was needed as an atmospheric effect in the scene. Like the rain, it was made using Particle Flow with wind force. For visualisation, the AfterBurn plug-in was needed. It could then be animated and non-uniform, which is much better if we simply use ZBuffer! The AfterBurn effect was appointed to the Particle System in the Environment and Effects window with parameters from the dusty scene (AfterBurn tutorial scenes).

Rendering

The scene was rendered in some passes (main, fog and rain) using V-Ray render by ChaosGroup without Global Illumination in order to reduce the render time and the computer's resources. Standard options were used; I only changed the anti-aliasing filter on Catmul-Rom, while in the adaptive subdivision window image sampler I changed the value of Clr.thresh to 0,0.

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Maya: General
Lance Hitchings
www.hitchingsdesign.com

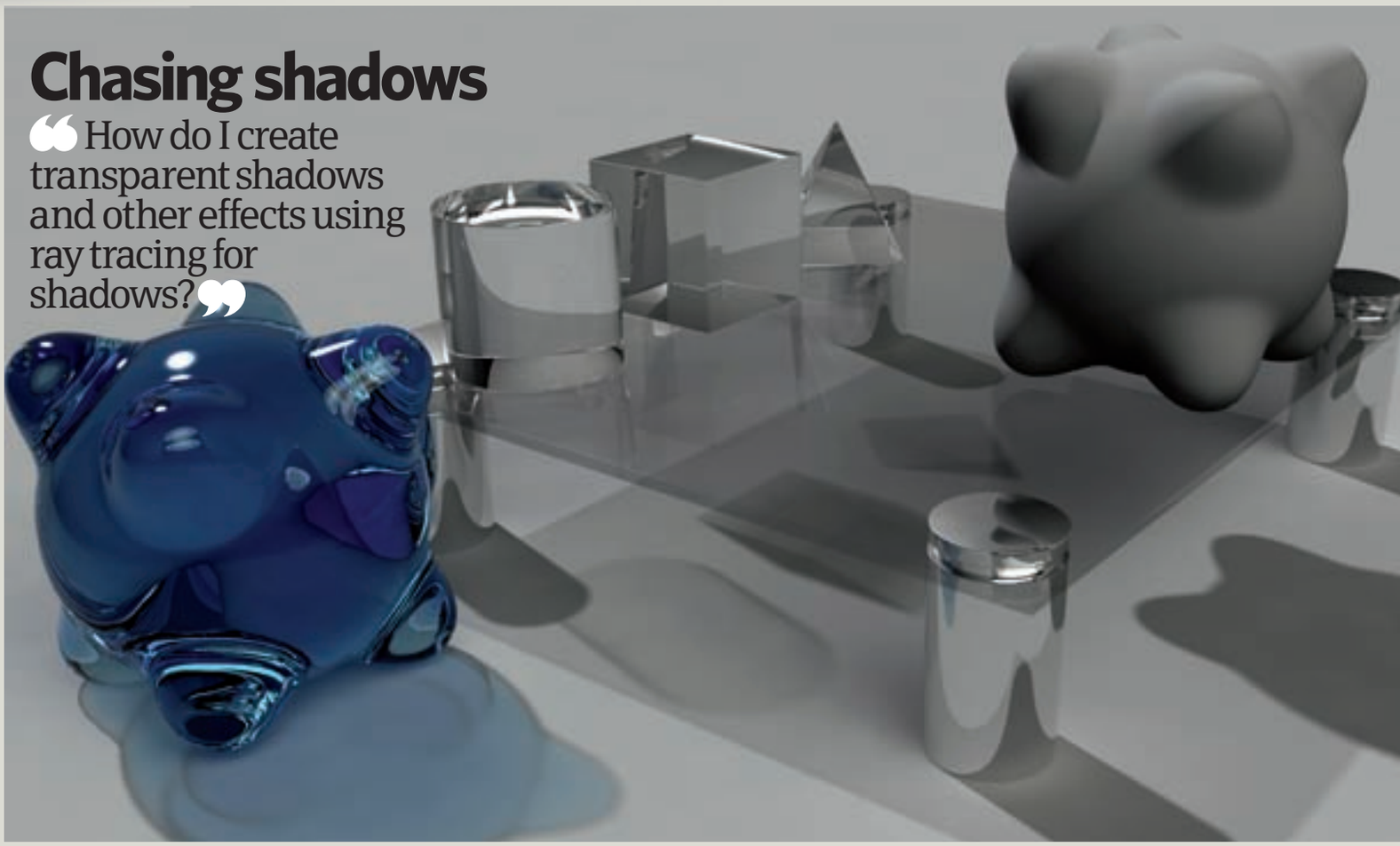
Lance is our Maya master and in this issue he tackles the problem of getting shadows to render properly through transparent materials. Get your rendering hats on

Maya: Games
John Haynes
zugok@sbcglobal.net

John works on characters for games at Sega in California. In this issue he tackles the subject of hints and tips for hard-surface modelling when applied to low-poly game models

Chasing shadows

"How do I create transparent shadows and other effects using ray tracing for shadows?"



In the pursuit of photorealistic images, everything seems to come down to light and shadow. The use of Global Illumination and image-based lighting can produce realistic renders, but this effect can fall apart if your scene contains direct lighting combined with reflective and refractive materials. This produces unrealistic results; where shadows disappear when seen through refractive surfaces, reflections disappear if they are in shadow, and transparent shadows just look wrong.

These are ray tracing issues, corrected by adjusting the Raytrace values within the Render Settings and the Attribute Editor for the shadow-casting lights.

To get transparent shadows, we'll need to be using a transparent material and a shadow-casting direct light with Use Ray Trace Shadows turned on under the Shadows>Raytrace Shadow Attributes tab in the Attribute Editor.

A

01 Default Raytrace settings

We'll start with a simple scene containing several reflective and refractive materials, as well as a directional light. The glass pig and the left sphere are mia_materials using a couple of different glass presets. The middle and right spheres are blinns that use a Sampler Info node to control reflectivity and transparency. The tabletop is a mia_material using the thin glass preset and the table legs are mia_materials using the chrome preset.

We'll start with ray tracing turned on in the Render Settings with the default values. The tops of the chrome table legs look okay and we can see some transparent shadows, but none of the glass objects seem transparent A.

02 Crank it up

The first step is pretty obvious. Increase the Reflections, Refractions and Max

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growing community at www.3dartistonline.com

3ds Max
Ryan Knope
info@ryanknope.com

Ryan is our architecture and 3ds Max expert. In this issue he's creating an interior swimming pool complete with lighting. Check out the caustics.

CINEMA4D
Daniel Lovas
http://lovas.cgsociety.org/gallery/

Daniel is our resident CINEMA 4D and sci-fi specialist. In this issue he tackles the subject of animation if you don't own the Mograph module. Files for this are on the disc

Vue
Dominic Davison
www.3dartistonline.com/show_profile.php?userid=382

Dom is one of the top people creating realistic landscapes. In this issue he explains how to create wet looking stones using the material properties

Poser
Paul Francis
www.renderosity.com/homepage.php?userid=4147

The latest member of the Q&A panel is Paul who is a former modeller for programs like Red Dwarf, and also a photographer. He brings those two perspectives to the Poser world

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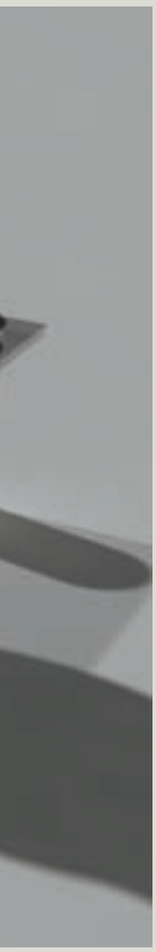

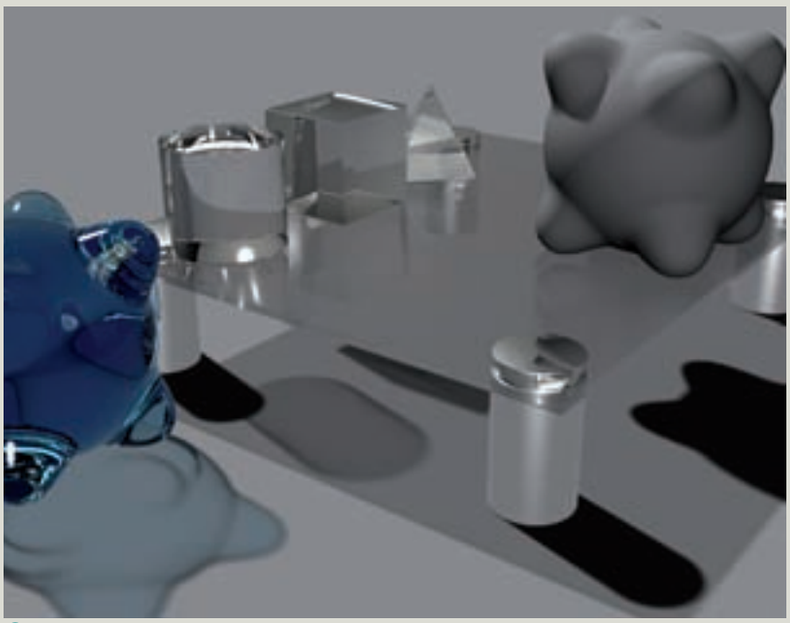

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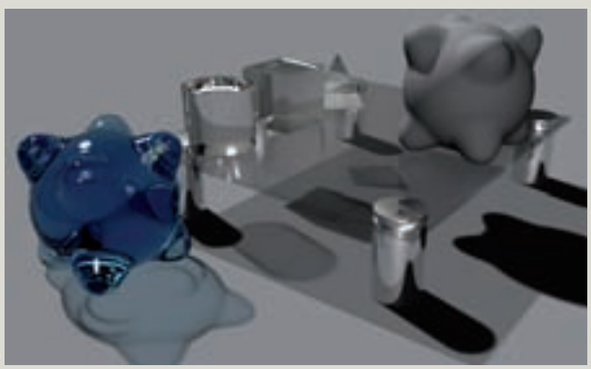

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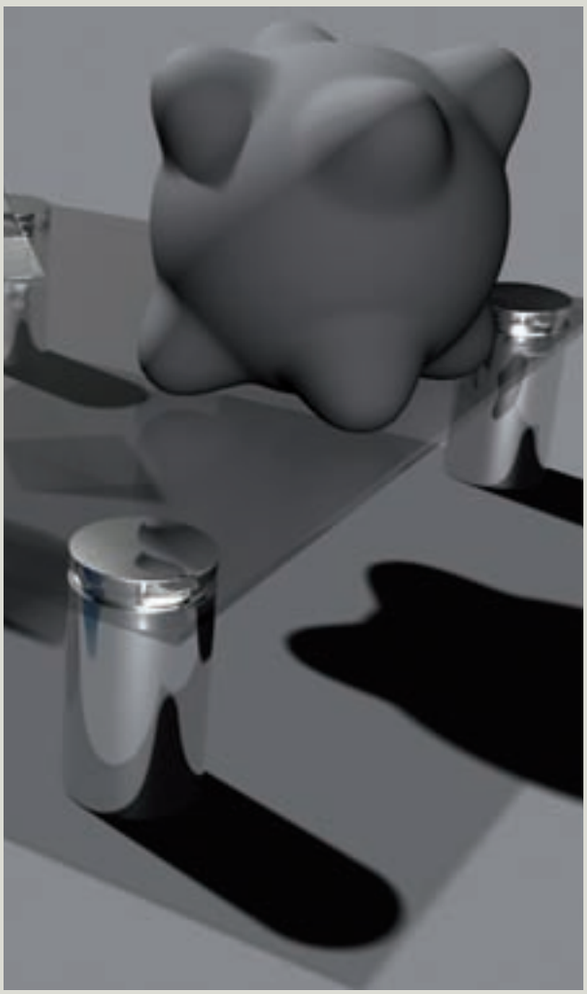

D

Trace Depth values in the Render Settings under the Raytrace tab. Make sure you use enough rays to pass through all sides of all objects, including multiple objects that are stacked up in front of one another.

Now all the glass objects are transparent and refracting properly, but there are still some problems. The shadows disappear when seen through the glass table, and there are no reflections on the chrome table legs when seen through the table glass or where they fall into the shadow cast by the table glass B.

03 Turn up the shadow rays

These problems are fixed, not by adjusting the Reflective or Refractive settings as you might think, but rather by adjusting the Shadow settings. This needs to be done in two places.

First, again in the Render Settings under the Raytrace tab, we need to increase the Shadows value enough to ensure that the shadow rays are passing through enough surfaces and bouncing off enough surfaces to capture all of this detail.

Second of all, in the Attribute Editor under the Shadows>Raytrace Shadow Attributes tab of the shadow-casting light, increase the Ray Depth Limit to the same value as Shadows in the Render Settings. Both of these adjustments are required in order to get the shadows and reflections to render correctly.

However, even though they are now visible, they don't look very realistic. The shadow cast by the glass pig in particular seems pale and washed out C.

04 The final fix

The problem is caused by using the Simple Shadow Method under the Shadows tab in the Render Settings. Simple shadows are quick and work great with ordinary opaque shadows, but not so great with transparent shadows. Change the Shadow Method type to Segments, which works much better with transparent shadows. If you decide to render your scene using image-based lighting, make sure that the Reflections, Refractions and Max Trace Depth values under the Final Gather Options tab match those under the Raytrace tab in the Render Settings D.

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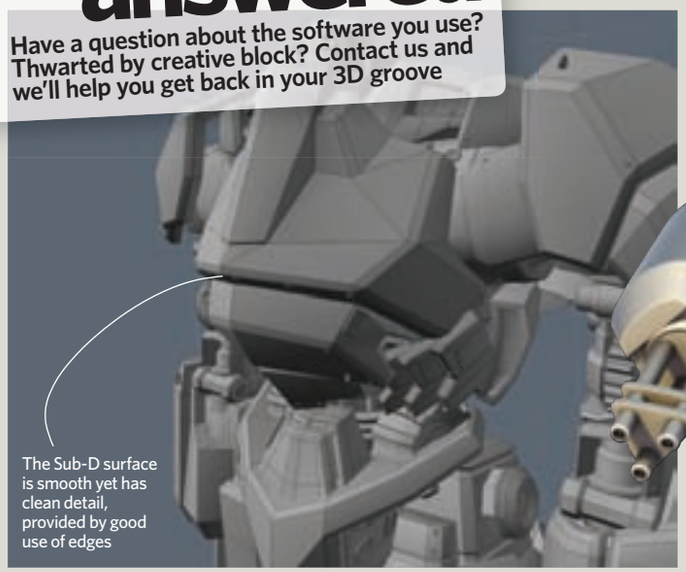


The Sub-D surface is smooth yet has clean detail, provided by good use of edges

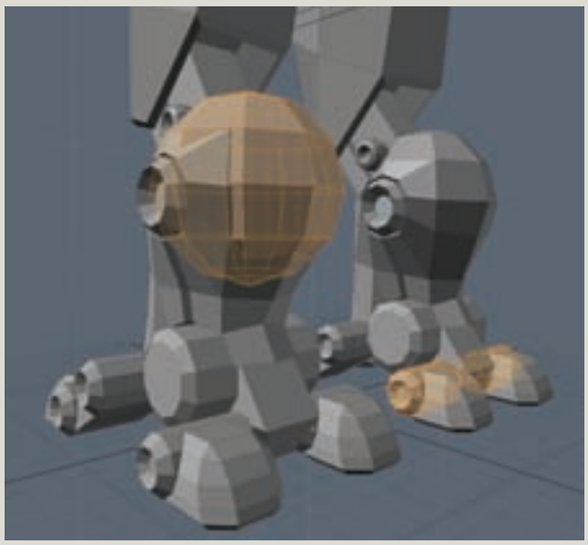
Learning about modelling

"Can you give me some hints and tips on hard-surface modelling techniques?"

When modelling hard surfaces, it is important that the surface has certain elements that help to define it as a rigid form. Additionally, hard-surface elements might have more or less emphasis depending upon the type of object. A basic static object generally has forms that are flat and tend to not flow into each other, so it is easier to get a hard-surface feel. However, objects like a robot or body armour may have forms that have an organic flow, so the other elements of hard edges, smooth surface and geometric detail become more important in order to maintain a hard-surface look.

Hard-surface objects are best created in several stages or passes with polygons converted to Sub-Ds to get a smooth surface. Starting with the whole volume and silhouette, this is often referred to as box modelling, which is then refined with the major geometric detail, usually by using Booleans so the added shapes remain even. More edges are added to create an even quad polygon distribution, plus surfaces that are attached to Boolean objects are cleaned up, with the vertices connected to form quad polygons where possible. Finally, add smaller details by creating separate shapes that are not welded to the base form so the smoothness of the surface is maintained.

01 Create the object's volume and form without worrying about details that do not significantly affect the silhouette. Work with the object centred and straight along one axis to help maintain a smooth surface. Plus many of the transform tools tend to work better. When complete, evenly subdivide the surface by using a Slice or Edge Duplicate tool. Pay attention to adding edges to areas that will help form even quad polygons and smooth edge loops. Avoid triangles, as they tend to form valence points of the surface.



02 Add and refine some of the form details using similar basic primitives, as they usually have even curves and arcs that rigid surfaces tend to have as well. By using a Boolean operation, replace any parts of the object's surface with Boolean shapes while trying to maintain the even arcs and curves the shapes might have.

03 Add additional bevels on any outer volume edges to maintain the volume when the object is converted to Sub-D. The bevel will help to define the edge, as most object edges aren't sharp. Raw polygon edges are infinitely sharp and are best only used for edges of blades. Separate objects such as small panels and rivets are also added here.

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A swimming time

"My project is to model a house with an interior swimming pool. What's the best way of creating this and what do I need to look out for, as it is inside a room with glass window panels?"

Here, I will cover two aspects of pool creation with both interior and exterior shots considered. The first involves setting up your environment and windowpanes in a configuration that easily works with you rather than against you. The latter, pool water materials, I can only touch on briefly, as it will cover much more space than is allotted in this column.

Keeping both aspects in mind and consciously using them to your advantage will definitely aid in your pool renderings, whether it is an interior or exterior shot.

Build the environment

When building the environment, I tend to fake some aspects to achieve easier and better lighting. For example, with back-facing windows I tend not to put in a pane of glass. This will help light penetrate into the interior room as well as help light up the water with the materials I will go over in the next step.

In the bottom screenshot, you can see interior and exterior shots with different glass panes included. The red lines show the glass pane configuration. Depending on where your shot is coming from, this can help to significantly reduce the effort with lighting your scene. See how the interior shot is much less affected, and how the exterior shot with four sides of panes has darkened the back windows. I used the Arch & Design Solid Glass preset. The Sun System is set to 4.0 with MR Photographic Exposure control set to Exterior Daylight.

Tricky little water

Pool water tends to be tricky. The packaged Arch & Design Material water preset tends to only really work well with ocean water, for example, where you cannot see the bottom or into the water past the reflections.

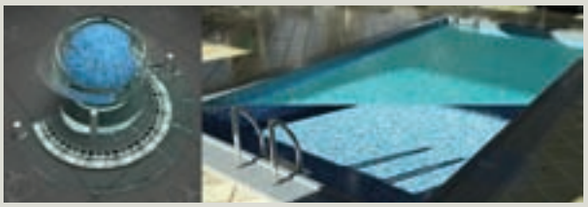
In recent months, I have been using a pool water material set from www.mrmaterials.com. It has been quick and easy, allowing me to focus more on the modelling and composition rather than how the water appears. This material set works in a one-two punch. The water material has the water surface covered in a basic manner. The pool tile material has the bottom and sides covered, and has an added benefit – fake caustics that pass the test in most architectural and interior design cases. The caustic effect will show up where there is sun, although in shadow it will not.

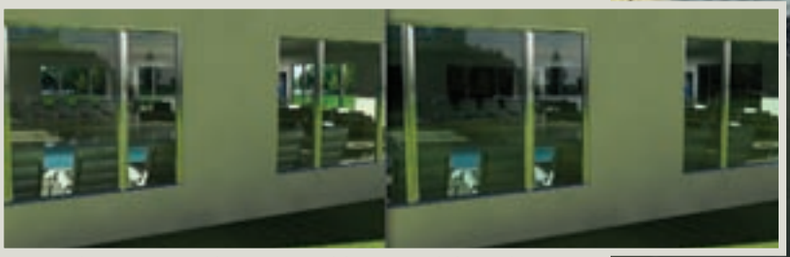
Afterwards

My advice would be to download and test the material. Dissect it, figure out how it works and how you could make it better suited for your projects.

If you have control over your shot, pick the easiest way to achieve a great result and don't be afraid to fake things. In the end it is about the final image looking great, not whether it is physically accurate by numbers or algorithms.

You can find the Arch & Design Material (created by Jeff Patton – www.jeffpatton.net) that I used at http://mrmaterials.com/resource-central.html?func=fileinfo&id=975/. You have to create a login, but it will prove worth the minute or two.





Using windowpanes in smart locations around the room can help greatly in lighting and composition

Below left: A render from mrmaterials.com

Below: A render showing both pool materials in scene

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3DArtist

Your questions answered

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Falling dominoes

"I do not own the latest MoGraph module, so how do I animate a circle of falling dominoes using the Dynamics module in CINEMA 4D?"

First of all, I'd strongly suggest to anyone interested in creating dynamic interactions of the kind to upgrade to the latest release of the program (11.5) and get MoGraph, as it offers some new and much more elegant tools for the purpose. If it is not possible, follow this short tutorial. It is intended not only for the users who own the Dynamics module and do not own the MoGraph module, but also for all the numerous ones that are still using a version of CINEMA 4D older than the latest release, regardless of whether they own MoGraph or not. We will set up a simple scene, containing a set of upward-standing dominoes arranged in a circle on a ground surface and with the first one in an unstable starting position.

We'll start by creating a ground object, a domino object and invisible doubles for both of them. Why do we need the doubles? The actual dynamics simulation will take into account only the invisible doubles while the visible objects will be grouped as their children and will follow them. That will provide for a cleaner and faster dynamics calculation and will also let us adjust the simulation easily if the need arises. For example, it will come in handy if the fallen dominoes do not lie exactly on the ground object but levitate slightly over it. Instead of fiddling with various dynamics parameters and thus risking losing control over the simulation, we will simply resolve the problem by lowering a bit of the invisible double of the ground object, while keeping the visible ground in place.

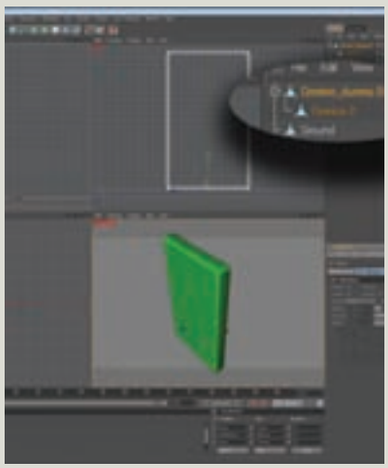
Next, we need to create additional dominoes. If you do not own the MoGraph module, you can use the Duplicate function for that. For a correct dynamics simulation, you need to set the initial position of the dominoes exactly on the surface of the ground object, with only the first one in an unstable position. That position will then be set as the start-up position for the main simulation. And, of course, before we start any dynamics simulation we also need to add some dynamics quasi-objects to the scene, like the Gravity object and the Solver object. Last but not least, all the invisible object doubles and the ground object need the Rigid Body Dynamic tag added to them.

Initial unstable position

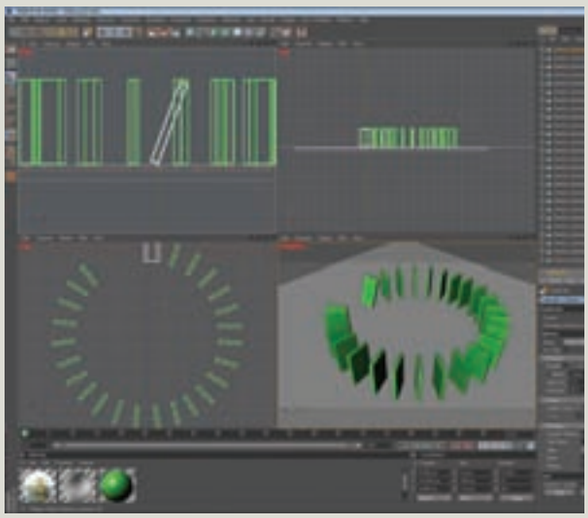
The first domino should be initialised in an unstable position in order to start falling as soon as the simulation starts. It will become unstable once it is rotated around its lower edge for such an angle that the gravity vector through its mass centre hits the ground outside the footprint of the domino. In this particular case, 20 degrees should be enough.

If all the dominoes are unstable even before they were hit, check that they are initially positioned exactly on the ground's surface. You can also run a simulation with all of them vertical and slightly above the ground; once they fall steady on the ground, set their position as initial.

01 Prepare the ground
In Project Settings, set the Frame Rate to 25fps, Minimum to 0 and Maximum to 99 frames. Add a cube primitive to the scene, rename it 'Ground' and set its size to 2000, 30, 2000. Make it editable then transfer the local axis five units up. Duplicate the object and rename it 'Ground_dummy'. In the Point mode, select all four of its upper vertices and set their Y co-ordinate to 0.



02 Prepare the domino objects
Set the visibility dots so that the Ground_dummy object is invisible in render and that the Ground object is force-visible in render. Create another cube primitive and rename it 'Domino', size it to 20, 200,120, fillet its edges to five units, make it editable, transfer its local axis to 10, -100, 0 and make it force-visible in render. Add yet another cube primitive, rename it 'Domino_dummy', size it to 14,194,114 and make it editable.



03 Duplicate the dominoes
Snap its local axis to the position of the Domino object's axis, make it invisible in render and make the Domino object its child. Once in Object mode, drag the Domino_dummy object so that it lies exactly on the Ground object. Using Duplicate with Instancing off, create 25 copies of the Domino_dummy along a horizontal arc with the diameter of 430 units and distance between them of 100 units. Select all the dominoes plus the Ground_dummy and add a Rigid Body Dynamic tag to them.

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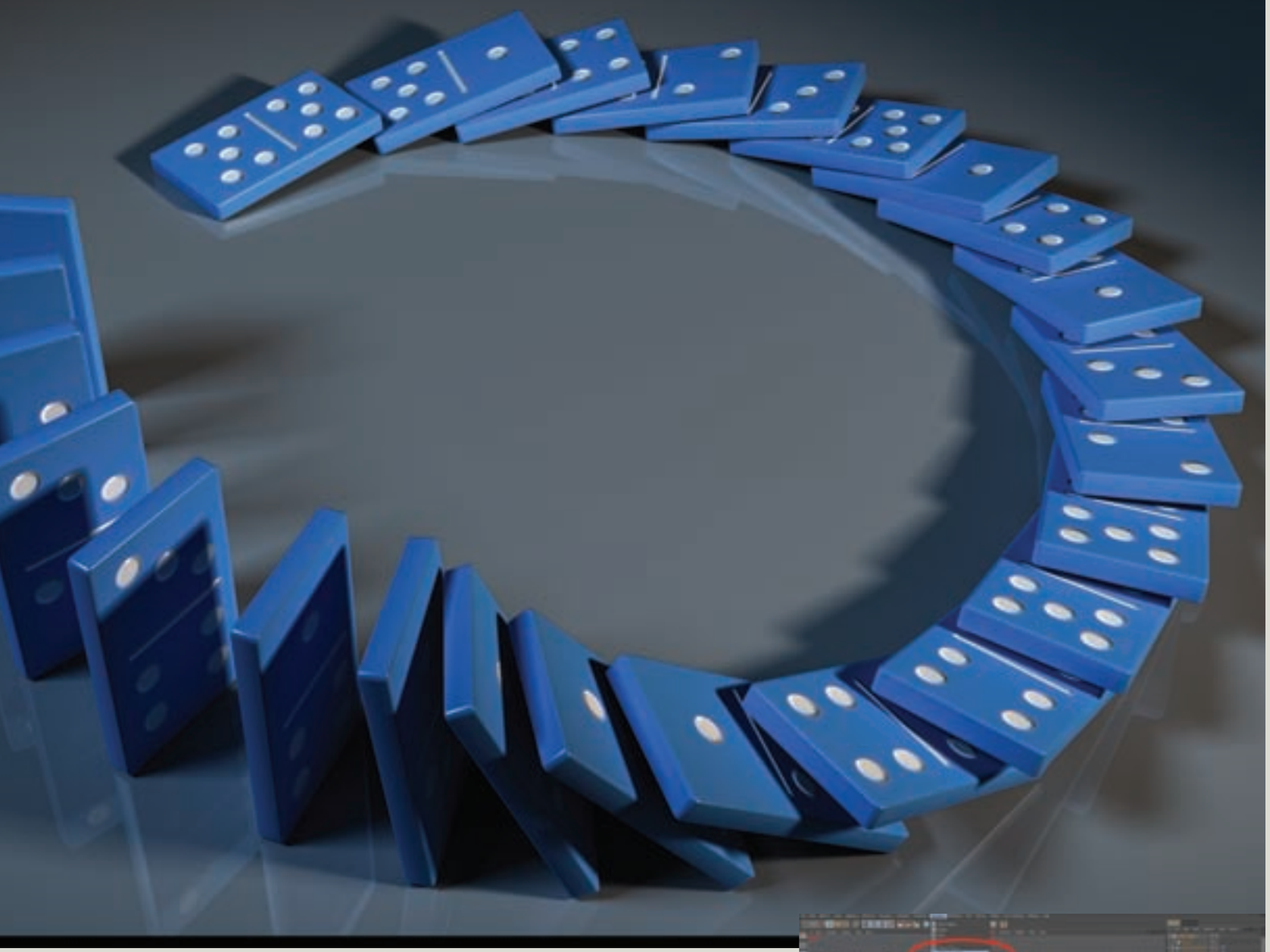
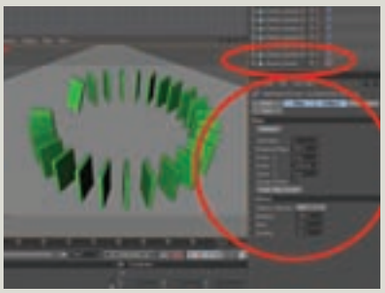
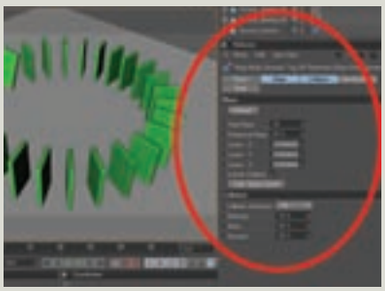




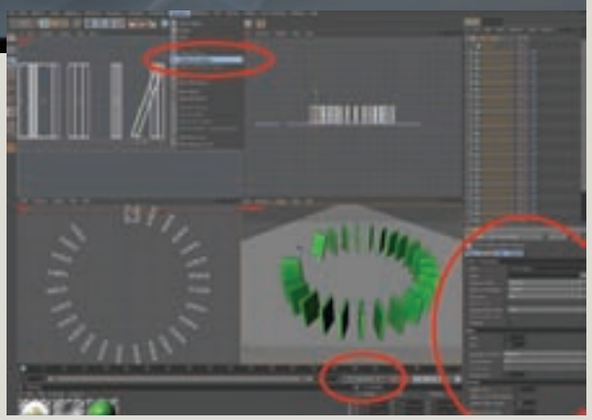
04 Set dynamic parameters for the ground

Select the first domino and set it in an unstable position. Hit the Rigid Body Dynamic tag of the Ground_dummy object. In the Mass tab, first click on the Calc. Mass Centre button then set the Total Mass to 0 units and set the Rotational Mass to 100%. In the Collision tab, set Collision Detection to Full, Elasticity to 100% and both static and dynamic friction coefficients to 50%.



05 Set dynamic parameters for the dominoes

Select all the Rigid Body Dynamic tags of the dominoes. In the Mass tab, set Total Mass to 10 units, Rotational Mass to 20% and click the Calc. Mass Centre button. The Mass Centre co-ordinates will be blanked but it is expected, as more than a single object is selected. In the Collision tab, set Collision Detection to Full, Elasticity to 10% and both static and dynamic friction coefficients to 50%.



06 Finalise the dynamics setup

Add the Solver and the Gravity objects. Turn the Solver off and make all the other objects its children. In its settings, set the Start to 0 and the End to 99 in the Main tab, set the Integration Method to Midpoint, Oversampling to 32 and Energy Loss to 5%. In the Details tab, set the Collision Eps to 10, turn on the Use Rest Speed and set it to 100 units. In the Gravity Settings, set the Field Strength to 10. Now select Dynamics – Initialize All Objects and finally turn the Solver object on. Hit the play button to check the simulation.

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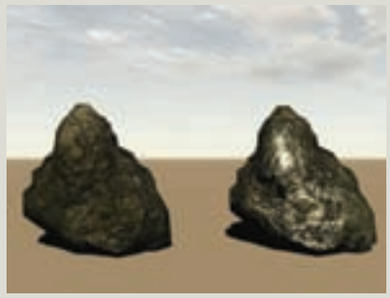
Wet stones

"I want to create a scene with lots of stones in the foreground, which looks like it's been raining because it's going with a stormy sky. How do I get wet stones?"

Creating wet-looking rocks or stones in Vue can be achieved in a number of ways. Before you begin you need to choose the right atmosphere, as this will affect the appearance of the rocks just as much as the rock material itself. Lighting is obviously important, because you will need to get the reflection of the wetness. So increasing the sunlight levels in the Atmosphere editor is important, or adding extra spotlights on the stones is also worth considering. Basically, anything to highlight the shininess of the stone is favourable here.

Ideally, you will need to change the material of the default rock provided in Vue. Go for a material with a smoother appearance. There are a number already preloaded in Vue. For this tutorial the rocks/stones are fairly close to the main camera, so I required more photorealistic textures and materials. I chose the Rock Piles collection from Cornucopia3d.com. Even with a more detailed-looking stone, this is still only part of what we really want to achieve. To make the stone look wet, we can combine or mix the materials with another object. We can also add material layers such as Wet Stones to our original object layer, which can give interesting results. If you want to create a stone with only half of its surface appearing wet, adjust the Influence of altitude slider, which is accessible by clicking the Influence of environment tab.

I have found the easiest and quickest way of achieving wet-looking objects is to simply adjust the highlights and shine of the stones themselves. This is a method usually applied to water surface properties, but can be just as effective on other materials. From your own experiments you will find your own personal preferences, as there is usually more than one way of doing things in Vue.



01 General setup

Open a new scene and choose any atmosphere. Now increase the light balance in the Atmosphere settings towards sunlight to get the full reflection of the wetness. Load a new rock, edit the object (Cmd/Ctrl+E) and check Dynamic subdivision. Use a quality boost of 1 to make it look smoother and reduce the bump settings in the Material Editor. Also darken the colour of the stone because wet stones look darker.

02 Create the wet look

To get a stone material looking wet, you have several ways to achieve this. You could add the Wet Mud material layer to the original stone's layer. The easier way is to adjust the lighting of the stone's material. Choose the Highlights tab in the Material Editor and increase the Highlight global intensity to 100% and the Global size to (in this case) 23%. This last setting determines how shiny you want the stone.

03 Create lots of wet rocks

When you have your finished stone, you can now use this model as part of an ecosystem. Right-click the object and choose Save Object. Now you can use this object as part of a rock ecosystem. Remember in an ecosystem that objects generally all have their default material. You cannot edit ecosystem components individually, but you can access their material via the material browser. Experiment with different rock materials to get interesting results.

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If the face fits

> In the Face Room, there's an option to load your own face models. How do I use this and are there issues I should be aware of?

The Face Room is a dark place where a lot of Poser users are afraid to enter; I certainly was until I pushed open the door and had a look inside, and was pleasantly surprised with the result. The Face Room can indeed be used to make your own custom heads, and the results can be surprisingly good, but there are limitations, as with any software. The first surprise to me was that the Face Room only works on a select number of figures, in this instance the G2 range of figures such as Simon, Koji, Sydney, etc. As far as I know, it won't work with the DAZ Studio range of characters.

I found that it helps to set a goal to work towards, rather than just going in and doodling around. In this instance I decided I would start off trying to make a self-portrait to see just how good a Poser render can actually be, and how effective this modelling tool is.

The first stage is to get yourself your head shots – you need one from the front and one from the side. The photos are best taken against a plain background, with even lighting.

Importing your photos

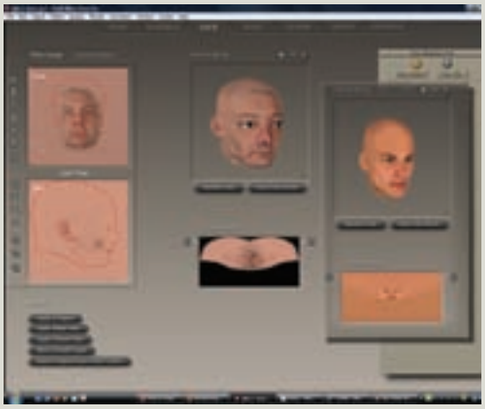
In the Face Room, at the top left is the option to load the first photo, the front view. Once you have located the file, Poser asks you to identify two points, the outer corner of the eye and the corner of the mouth, and there is a similar process for the side view, with the tip of the ear and the point of the chin. Once loaded, Poser applies your photos as textures to the head model, and offers you a 3D preview on the right, which can be zoomed and rotated using the standard Poser controls.

Lining up your photos

Once the photos are loaded, you need to begin to align the physical features in the photos with their counterparts on the 3D head model. There are three methods of doing this: the green interactive control points you can see superimposed over your photos; the photo line-up tools down the edge of your photos, such as Pan, Zoom, Rotate, etc; and the control dials over on the right. Getting the photo to line up is important if you want to create custom textures as well as 3D geometry from your photos. In the end, I decided to only go with the geometry and use textures I already had.

Importing the front and side views from your own photos onto the standard Simon G2 head

Poser has used the photos to produce a 3D sculpture, which is then fine-tuned using the morph dials and control points



Shaping the face

There are a wealth of adjustment dials down the right-hand side of the screen that help you to fine-tune the 3D model. Poser does a good job of the initial sculpt from the photo, but needs a little help to get it right. You can see in the screenshot the difference between the standard Simon G2 character and the custom model produced from a photo of me with a bit of sculpting.

The final 3D model can be applied to your figure as is, with or without a texture, or Poser can generate a morph target from your custom model for use as you wish. I used the model created in the Face Room for this self-portrait in Poser Pro.

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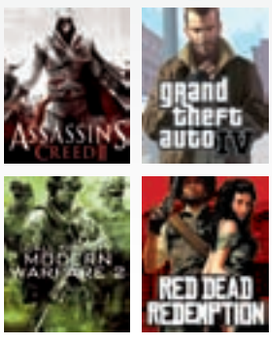

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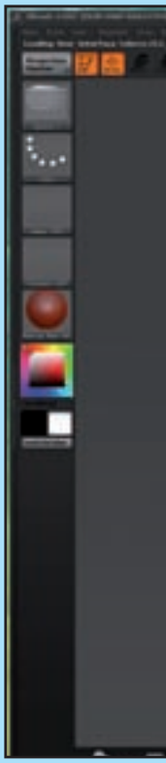
Combining ZBrush modelling with the rendering tools of a traditional 3D application is the most common workflow for most users, with normal mapping used to retain ZBrush's detail without its crippling polygon count



ZBrush 3.5 $595

There's more new brushes in version 3.5 along with a whole new way of starting your ZBrush creations

Since its introduction, ZBrush has been an instant hit with almost everyone who used it. Its organic, intuitive tools completely revolutionised organic 3D modelling, and the ease with which it handled models with millions of polygons converted seasoned professionals and newcomers alike.

Since then, updates have been slow to appear but generally massive. The program's architecture has allowed enthusiasts to write add-ons to push the program on between updates, and the program's only real disappointments have been the compromises modellers have had to make when taking their work from ZBrush into more traditional 3D applications for rendering and animation.

> "Version 3.5 is not short on new features. The most instantly impressive of these is the upgraded ZSphere tool"

In version 3.5, ZBrush's interface has become marginally less cluttered. It's still packed with tiny icons, buttons and menus, but there's now a quick button that allows you to switch instantly between layouts for sketching, modelling and painting, making the most common tools a little more easily available. There's also a handy lightbox at the top of the screen that allows for quick access to recent models.

Version 3.5 is a free upgrade for current users, but it's not short on new features. The most instantly impressive of these is the upgraded ZSphere tool. ZSpheres are ZBrush's primary tools for sketching out shapes before you start sculpting their details. They allow you to draw rough shapes with spheres connected by bones, and then, by manipulating the bones, refine your object before you convert it to polygons for sculpting.

ZSpheres II takes this a stage further, allowing you to sketch additional detail on top of the spheres without losing their editing functionality. In other words, you can draw the arms and legs of a creature with ZSpheres, then sketch in muscles and shape with the new tools. As you work, you can then return to the underlying ZSpheres and move them, changing the pose, altering the scale or adding new limbs. The detail you've created will then adapt to the changes. The new toolset is a great addition, allowing you to work on your initial shapes much more freely than before.

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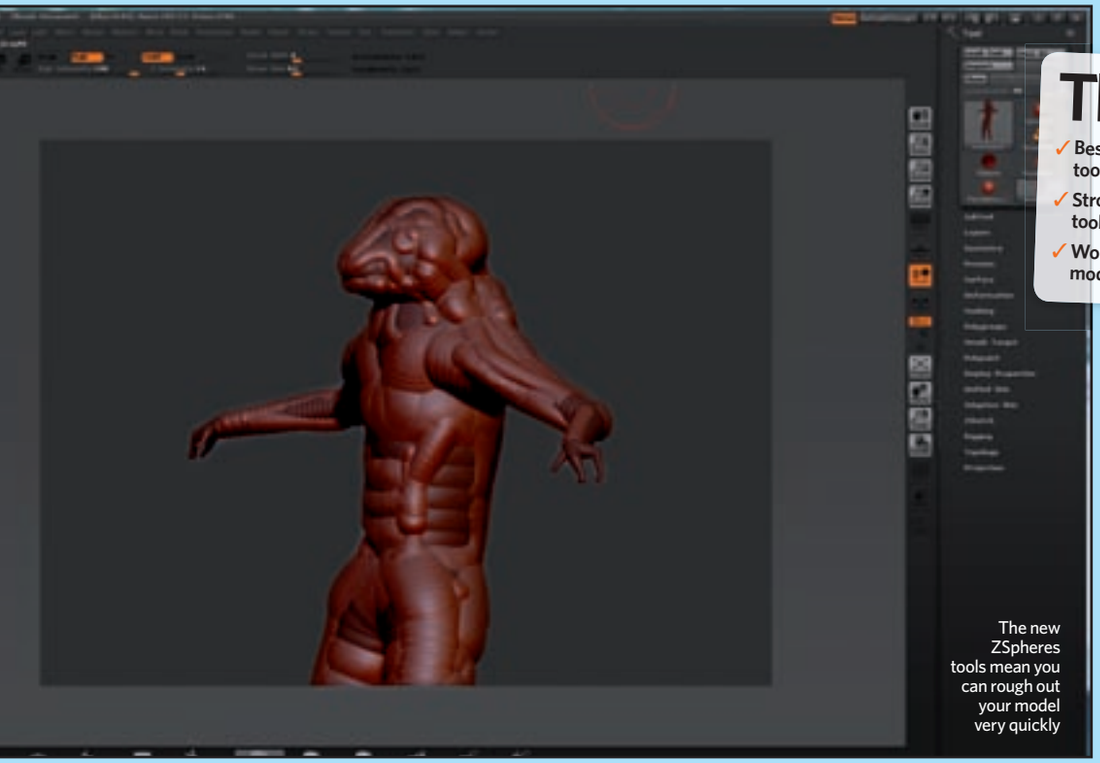


The new ZSpheres tools mean you can rough out your model very quickly

The good & the bad

- ✓ Best organic modelling tools available
- ✓ Strong texture-painting toolset
- ✓ Work with multimillion poly models easily
- ✗ Interface and menus are complicated
- ✗ Documentation is poor

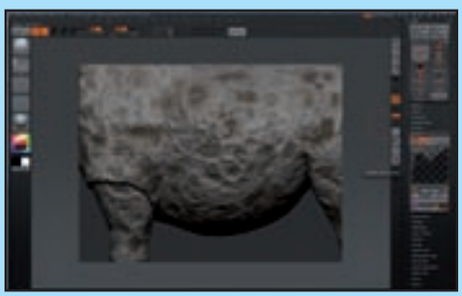
Essential info

www.pixologic.com
$595 US

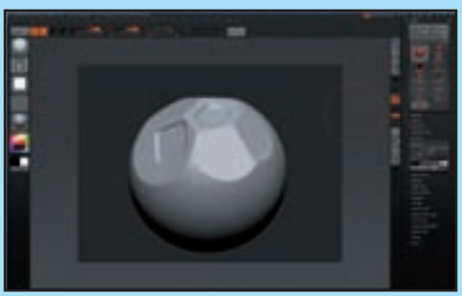
OPERATING SYSTEMS
- Windows 2000/XP SP2 / Vista
- Mac OS X 10.5 or later

OPTIMAL SYSTEM REQUIREMENTS (MAC)
- PowerPC
- 2GB RAM

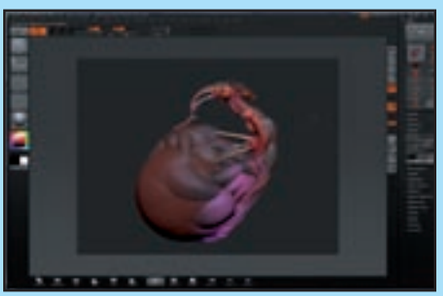
OPTIMAL SYSTEM REQUIREMENTS (PC)
- Pentium D or later
- 2GB RAM



Noise
The Surface Noise tool lets you add complex detail without affecting your sculpting



Planar
The new Planar brushes allow you to sculpt flat edges and geometric shapes into your objects



Interface
The new interface is slightly easier to work with and offers a set of instantly interchangeable layouts

You can also paint onto ZSpheres, which lets you start to colour your object before you even finalise its shape.

Several new brushes have been added, and the most significant of these are the Planar brushes. Basically, these flatten areas to a given angle, allowing you to sculpt sharp edges for the first time and build hard-edged objects in the same way you build organic shapes.

This tool is useful but it's not perfect. It takes a little getting used to, and unless your models have a very high level of subdivision you don't get crisp edges. However, the improvements in the LazyMouse tools do let you create brushstrokes with more evenness and precision than before, so sculpting man-made objects has become easier.

The new Noise tools are very effective. They let you add controllable noise (rough surface textures) to your models in a very adaptable way. Noise can be fine-tuned using a graph, and you can even colour the bumps or dents you create with the Noise tool automatically. Crucially, the noise isn't actually applied to your geometry until you want it to be, so you can build, for example, a rough skin texture but still sculpt and smooth the geometry to remodel the figure underneath without damaging the noise texture. Once you're happy with the look, you can bake the noise onto your mesh ready for export.

Overall, ZBrush 3.5 adds some powerful functions and the program remains an almost essential part of the toolbox of any serious artist. It hasn't quite cracked hard-edged modelling with the Planar brush but it's on its way, and the noise and ZSpheres tools are superb additions.

Our verdict

Features	9/10
Ease of use	8/10
Quality of results	9/10
Value for money	8/10

> "A package that's changed the game for organic modellers. 3.5 continues to stretch what's possible"

Final Score 9/10

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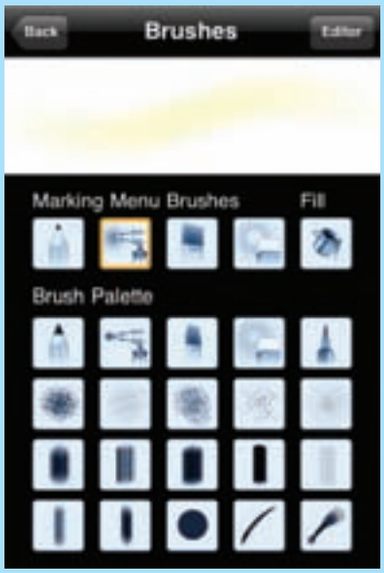
Tapping the small circle at the bottom of the screen brings up the menu system, offering a choice of tools, layers and colours



There's a choice of Pencil, Paintbrush, Airbrush and Fill Flood can, plus predesigned brush types that can be edited

There is a layer system – either three or six layers – but how they work is about as basic as it could possibly be

Autodesk SketchBook Mobile £1.79

Why sit inside sketching models when you can do it on a bus with your iPhone or iPod Touch?

It might seem a strange departure for Autodesk to be making iPod Touch/iPhone apps, but with the popularity of the devices and the eminent suitability for porting the original SketchBook application over, maybe it's not such a surprise after all. There's certainly a big price difference when you go mobile, down from the $100 asking price for the desktop program to $2.99 or £1.79 for the Mobile version. SketchBook is, as the name suggests, a handy, portable sketchbook for drawing and painting. The four main drawing tools are the Pencil, Airbrush, Paintbrush and Fill Flood can. There's also an Eraser to complement the Undo/Redo function and the Layer Delete option. On top of this, there are basic brush effects to mimic oily textures, chalky effects, sponges and crayons. Brushes can also be edited inside the app. Don't get too excited and think that this is mobile Corel Painter, though, because it isn't. The effect is still basic: there's no impasto and the colours don't have wet or dry characteristics or merge to form secondary colours. It's still painting how it was done on computers 20 years ago.

One of the clever aspects of the program is that it supports layers and also photos can be imported from the library straight onto any of them. There are three layers as standard, or six if you have the 3GS iPhone. What's let this down somewhat is that there are no blending modes for the layers; the content from one overlays the next. That's a missed trick. The layer manipulation is also basic and the program isn't that responsive.

As far as operating SketchBook goes, it's been well thought out, presenting a fullscreen view with just a tiny circle near the bottom. Tapping this brings up the operation menu with access to the colour wheel, tools and functions. What you can't see are the short cuts where tapping in corners of the screen can operate an Undo/Redo command, fit to screen and clear the current layer. Now, it's hard work to accurately draw anything at 100% on the screen with your finger, so thankfully the double-finger spread or contract operates the zoom. It also facilitates moving the screen around once you have zoomed in as well. This is quick and easy to use.

Images can be saved and exported and even loaded into the desktop version of SketchBook. There's two versions of the Mobile app – one is a free, cutdown app, while the other is the full-featured one for a paltry £1.79 ($2.99). As with all sketching and painting programs, a lot depends on your innate ability and here it's compounded by the fact that you have to use your finger to do it. While the painting effects are still nothing special, consider this a sketchbook with colour and fill facilities and the minimal asking price will seem very fair indeed.

> "SketchBook is a portable sketchbook for drawing and painting"

www.autodesk.com
iPhone 3G or 3GS, iPod Touch

Our verdict

Features of site	6/10
Ease of use	8/10
Quality of results	6/10
Value for money	8/10

> "Slick but not particularly comprehensive sketching and painting package at a low-cost price"

Final Score 7/10

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Stoney Creek Sprucevale $16.95

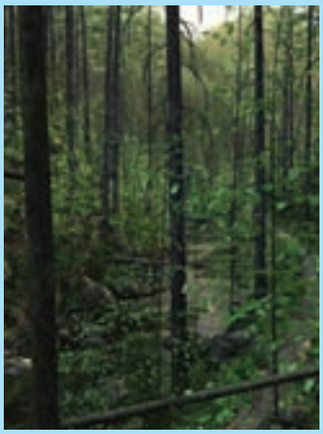
Take a hike into the mountains

Designed by Howie Farkes, Sprucevale is a standalone extension of the location he began with Stoney Creek. This is where the creek rises, deep in the Harpwood Mountains, so it's a lot more wild as a setting. Essentially, there's the creek running down the centre of the scene, with boulders to the left, a footpath to the right and pine-covered mountains in the distance.

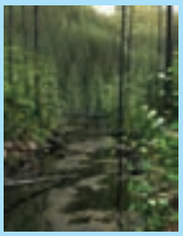
This is a DAZ 3D Carrara scene file with three different flavours for your use. There's a standard scene setting with a neutral atmosphere, a sunset version with weak and pale light coming through the trees on the horizon, as well as a foggy version. It comes in PC and Mac versions.

The key to any scene like this is how flexible, how much detail and how much depth there is in it. Well, there's room to place figures in the creek, on the boulders and, thankfully, along the path. You can elevate the camera and move into the scene a little way. However, there's no heading off into the woods because the stream finishes just about where you can see it, and the mountains themselves don't extend to the floor. This is to keep the detail and rendering down to reasonable limits because here's the main problem. There are masses of trees and leaves and stones, which make it look fantastic, but the price is a very high overhead. On one PC test the regular and sunset scenes were very slow to navigate, while the foggy version was completely unresponsive. You'll need a beefy graphics card to handle this. Equally, 2.75GB of RAM wasn't enough to render beyond a modest 1,000px-tall resolution. You'll need a system with more RAM than that to get a high-res render.

If you want to be picky then you could argue that the atmospherics aren't visually striking, with the sunset being pretty weak, but what you do get here is a photoreal location with masses of detail that can be explored to a reasonable, if not extensive, degree.



The creek looks nice, but it doesn't extend any further than the trees where the water is first visible



There's some room for elevating the camera from the initial ground level setting

www.daz3d.com

Our verdict

Features	7/10
Ease of use	6/10
Quality of results	8/10
Value for money	9/10

> "Masses of detail require a computer with decent specs to get the best results"

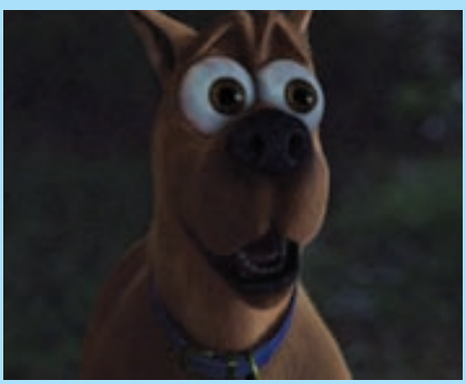
Final Score 8/10

Scooby-Doo! The Mystery Begins £15.99

CGI puppy in live-action origin story

While the first two Scooby-Doo live action films had a relatively big-name cast – Sarah Michelle Geller, for example – not to mention budget, this latest melding of CGI and human actors is basically a straight-to-DVD release. That means a smaller budget, no stars and a story set in and around their high school of Coolsville. Here, the gang of four meet up, form Mystery, Inc. and befriend the CGI puppy. The fact that this a joint venture with Cartoon Network becomes immediately apparent – it has that made-for-TV feel, and while CGI Scooby looks fine and furry as a cartoon dog brought to 3D life, some of the compositing and animation is weak. There are also ghosts on the prowl and here they are relatively simple but effective. There's also some particle effects with motion tracking that work well.

Of the human characters you'll recognise Shaggy and Velma, but Fred and Daphne are largely anonymous. There's some interaction between Scooby and the human characters, but not a huge amount or to any sophisticated degree. The humour has a diluted feel also, relying on simple slapstick, and with an actual running time of just 76 minutes the mystery is over as soon as it's begun. One for the kids rather than general family entertainment.



The design of Scooby is fine if not any advanced on anything you've already seen. In this scene, he's getting a shock

The rest of the CGI effects are nothing earthshaking, but they tend to work well within the parameters of the setting

Our verdict

Features	5/10
Quality of graphics	7/10
Quality of animation	5/10
Value for money	5/10

> "Slapstick humour and a short running time, along with no better than adequate CGI mark this as a TV movie standard effort"

Final Score 5/10

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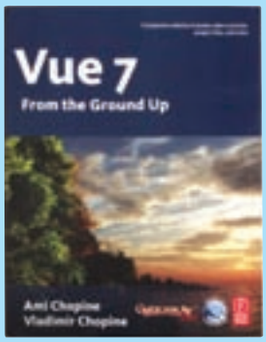
IT'S ALL ABOUT VUE
This book provides a complete beginner's guide to creating different kinds of environments using Vue 7

Vue 7: From The Ground Up £24.99

See what they did there?



Don't be fooled by the back-cover blurb. Husband and wife team Vladimir and Ami Chopine may come across, possibly somewhat inaccurately, from this cheerily brief write-up as dyed in the (organic) wool AD&D role players, hardcore cat lovers and post-Cold War hippies, but they know a good amount about Vue, even if they do come up with subheadings like 'The Laws of Digital Nature'.

In actual fact, most of this book deals with exactly that, so together with the book's *From The Ground Up* title, it almost forms a comedy pun of truly geeky proportions. Vue is most commonly used for creating 3D environments, and throughout the book a lot of the tutorials and artwork by invited modellers runs along this theme. From starting simple with snowmen, to moving into luscious lakes and futuristic spaceports, it's all about location, location, location. A simple look around the Vue interface leads on to chapters covering terrains, water, objects and much more. The language is fairly simple and informal, making it easy to follow, and the logical organisation of chapters and the effects they cover creates a progression through more advanced skills.

And while this book pitches itself at novice and intermediate users and even boasts glibly at one point that "Luckily, you won't have to be worrying too much about the math", its ending chapters deal with such niceties as running Python scripts to add in objects for you, so the book's reach is quite broad and will certainly ensure that any novices who pick it up won't be novices when they've finished.

The book is very well presented – you won't go more than a page or two without encountering a large, full-colour image of either what you're supposed to be doing in Vue or the object or effect your actions will produce. In addition, there are some truly lovely renderings from a collection of artists that show exactly what's possible with environmental design in the program. This, combined with the lively, clear writing style, ensures that *Vue 7: From The Ground Up* is an instructional, inspirational title with plenty of useful info presented in a transparent, encouraging way. This is an ideal starting point for those interested in 3D environmental design, and a must-have for intermediate Vue users as well.

info

AUTHORS
● Ami Chopine and Vladimir Chopine

PRICE
● £24.99

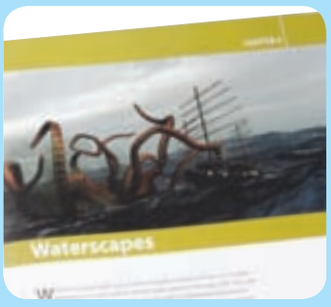
PUBLISHER
● Focal Press

ISBN NUMBER
● 978-0-240-81226-7

REAL RESULTS
Working to the clear and logical instructions and using the materials provided in the web-based tutorial pack, you will be able to create real Vue scenes

START SIMPLE
The first tutorial in *Vue 7: From The Ground Up* is a slightly more amusing version of the classic 'create a sphere' starting point that's common to most 3D tutorial guides

THE IMPORTANCE OF RESEARCH
Both the authors are clearly passionate about their subject, and the mini geography lesson that kicks off the Terrains section is a great example of their enthusiasm



INSPIRATIONAL ARTWORK
A range of 3D artists have contributed some truly stunning environmental renders, and these masterpieces provide some inspirational introductions to each section of the book

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Fantasy Art Now Volume 2 £20

Ilex's second collection of the best in fantasy art

For digital artists and 3D modellers, the fantasy genre provides a great deal of bread-and-butter work. From mythical beasts to romantic maidens and heroic warriors, film and videogames have a never-ending need to be supplied with pointy-eared denizens.

Keeping an eye on what's current helps you pick up the latest trends or prevent your concept art and renderings from becoming stereotypical. This collection from Ilex is packed with inspirational material, some previously published, some from the artists' personal portfolios. Mainly a blend of traditional and digital paintings, it also showcases a decent amount of concept art from games like *World of Warcraft*. The subject matter is mainly drawn from Tolkien-esque fairytale fantasy.

There's nothing here to expressly help create fantasy-based 3D models, but the eye candy will keep you entertained.

FANTASY SUBJECTS
Fairytale fantasy describes the majority of the artwork, but a few other genres do make a brief appearance

ELF MAIDENS
What kind of fantasy art book would this be without a chapter dedicated to the obligatory elven princesses and warrior queens?

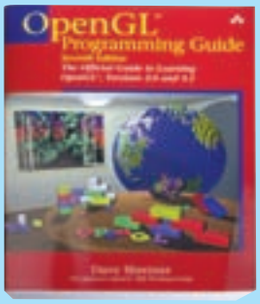
ACTION SCENES
The book includes a chapter on action scenes that showcases some fantastic battlefields in a range of styles and fantasy sub-genres

info

AUTHORS
● Aly Fell and Duddlebug
PRICE
● £20
PUBLISHER
● Ilex Press
ISBN NUMBER
● 978-1-905814-52-7

OpenGL Programming Guide $59.99US

Learn how 3D apps work and how to program in their underlying language



Let's talk about programming environments and middleware pipelines, shall we?

For hobbyist 3D users, this is perhaps the most terrifying part of the whole business, while for experts it can be a matter of professional life or death. Understanding the way 3D programs are built enables you to understand how they can be bolted together and produce the effects you want.

OpenGL is the powerhouse behind many 3D apps, and it manages how they interact with hardware and each other. It's made up of over 250 basic commands, but within this seemingly small set of programming rules there can be almost infinite variations depending on what information you build into the code. Learning how this underlying code works will enable you to do this more effectively.

While certainly not necessary for the enthusiast, this is an in-depth and extensive guide for those that really do need to know how OpenGL works.

PIXELS AND POLYGONS
Learn how OpenGL starts off with simple pixel and polygon-based models using anti-aliasing and basic depth effects

COLOUR
Discover how to work with objects, materials and lighting in order to create effective colour shading in the OpenGL environment

MAPPING
Learn how texture and environment mapping combine with underlying wireframes to create smoother, more realistic renderings

info

AUTHOR
● Dave Shreiner
PRICE
● $59.99 US
PUBLISHER
● Addison-Wesley
ISBN NUMBER
● 978-0-321-55262-4

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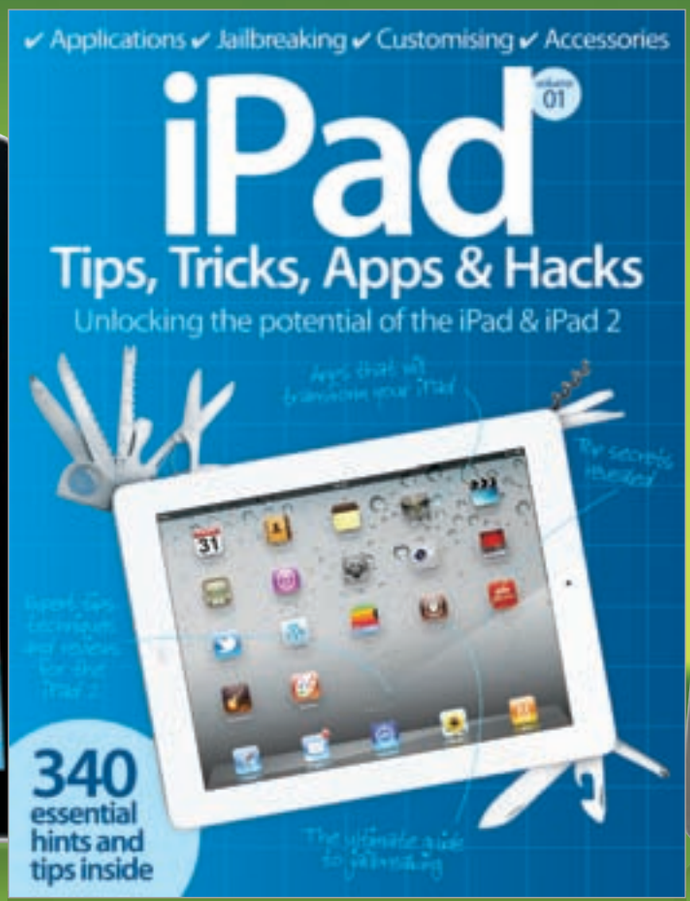
iPhone
Tips, Tricks, Apps & Hacks
The insider's guide to unlocking the potential of the iPhone
340
essential hints and tips inside

iPad



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Inside guide to industry news, studios, expert opinion and education

> There is no easy way, no simpler way than getting your hands dirty. You have to practise a lot until you have breakthroughs in animation

Daniel Moreno, character animator at Laruccia Animation Studios, on what it takes to make the grade. Page 104

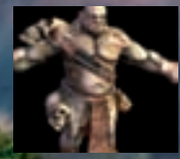
104 Insider interview
Daniel Moreno
This time, we're talking to a graduate of the Gnomon studio in LA who has worked on TV and animated CGI film as a character animator

098 News
Industry news
The hot topics concerning the industry are covered, including a report on booming CGI work and the visual effects in *Cloudy with a Chance of Meatballs*

100 Studio Access
Hydrophobia
When there's a game set in a flooded environment, realistic water flow becomes a real challenge. We look at the studio that's meeting that challenge

Inside

The Berlin Express arrives in Paris
Len Krenzler
Personal portfolio site
www.actionart.ca



106 Uni Focus
Portsmouth University
We take an in-depth look at the BSc (Hons) Computer Games Technology course on the south coast at Portsmouth University

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Boost in demand for creative CGI work

London agency reports an upsurge despite economic conditions

A B C

Over the last year, animation, visual effects and CGI budgets have taken a hammering thanks to the global economic recession, with the knock-on effect being a lower volume of work for specialist agencies around the world.

However, this appears to be a taking a positive turn if reports from one of London's most established retouching and CGI collectives is anything to go by. Happy Finish (www.happyfinish.net) has seen a recent surge in its creative CGI work, which – hopefully – indicates a boost in the global economic recovery.

The collective, which has been in existence since 2003, only launched its CGI unit, Happy Finish CGI, in October 2008, but it has since recruited a number of high-profile clients to add to its impressive portfolio of commercial photography and retouching.

Despite a necessary cut to advertising budgets during the credit crunch, Happy Finish has seen a dramatic rise in interest, as advertisers want to benefit from new technology to create more impactive results. Stuart Waplington, managing director of Happy Finish, explains why this is the case: "CGI can achieve high standards of photorealistic quality within a reduced budget. Another benefit is CGI's multichannel uses, allowing for one project to be used for print, web, moving images and interactive material. These multichannel possibilities are especially useful for companies who are increasingly looking for returns on investment focusing on the web."

Waplington is also keen to assert that the rise in advertisers turning to CGI production will not affect the photographic industry, as the agency works to re-create the visual style of the original photography in its CGI enhancements. CGI is increasingly becoming a standard part of the workflow, especially when it comes to cutting production costs.

Happy Finish works as a collective agency with award-winning retouchers and 3D artists who can be selected by the client to suit their needs. More information on the agency can be found on its website, which includes samples of work as well as progress shots.

A Happy Finish works closely with photographers to create a photorealistic finish

B The use of CGI in advertising cuts down production costs, as locations and sets are not needed

C Happy Finish is a collective of artists and the best person for each job is selected individually

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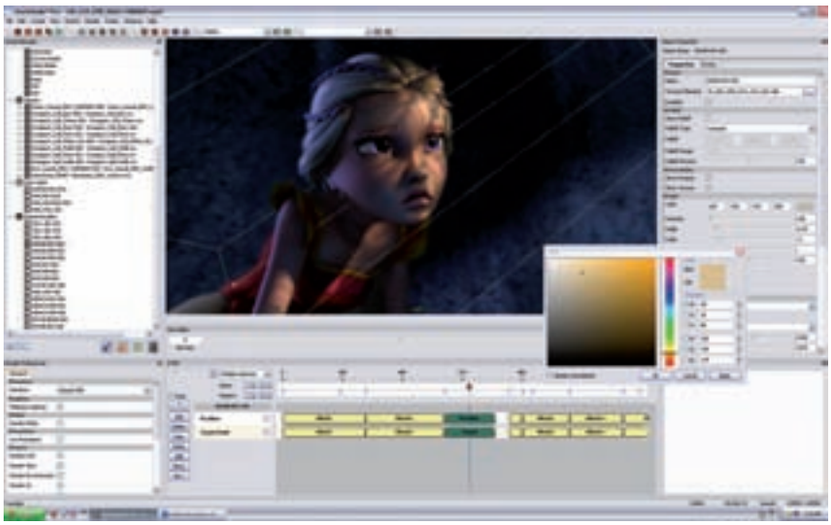
StudioGPU ships MachStudio Pro 1.2

Improved real-time workflow and rendering



D

Software developer StudioGPU has announced the release of MachStudio Pro 1.2, a real-time 3D workflow and rendering package, which aims to help speed up the workflow of 3D artists. The package uses the power of off-the-shelf GPUs to enable real-time performance on home desktop systems, bringing professional results to everyone.

The latest version of the software is packed with new and improved features, powered by the AMD ATI FirePro V8750 graphics accelerator, which comes with the software. One of these is displacement mapping using hardware tessellation to generate 3D details, better efficiency and improved control over surface geometry. It can also harness the GPU's power to increase the polygon count exponentially without any significant drop in render speed.

More new features include the stereoscopic camera support for anaglyphic effects, a custom cartoon shader for colour fills and outline rendering for a realistic finish and custom configurable anti-aliasing for high-quality results.

> "The workflow is similar to a virtual real-time 3D studio environment"

The workflow in MachStudio Pro is similar to a virtual real-time 3D studio environment, so 3D artists can control the lighting, camera views and perspective, as well as manage the lighting, shaders, materials, colour grading and ambient occlusion.

The website has a complete list of enhancements and additions to MachStudio Pro 1.2, which is aimed to support everything from CAD to animation projects. It is available for Windows XP Professional and Windows Vista, priced at $4,999, which includes a year of technical support and updates. Visit www.studiogpu.com for more.

D The workflow in MachStudio Pro 1.2 gives the artist control over all aspects of creation just like a real-time studio environment

E

Spaghetti tornado uses NVIDA technology

Pictures Imageworks creates stunning visual effects for latest film release

The latest animated release from Sony, *Cloudy with a Chance of Meatballs*, features groundbreaking computer animation sequences and visual effects. These helped to propel the film to a number one spot at the US box office as well as an impressive revenue take of over $60 million.

The visual effects have been created using the latest NVIDIA Quadro processors to accelerate production, most notably in one scene that features a spaghetti tornado. Elements for the scene were created in SPLAT, Sony Pictures Imageworks' proprietary volumetric rendering tool that runs on the NVIDIA Quadro GPU, which has the capability to create dust clouds, fire, sparks and even tomato sauce. As well as postproduction efficiency, NVIDIA Quadro graphics helped with the animation in Autodesk Maya with designers achieving 24fps, real-time previews on their work.

For more information, see www.nvidia.com.

E The spaghetti twister in Columbia Pictures' animated film *Cloudy with a Chance of Meatballs*

F

Test your 3D designs

A new service transforms CAD models into an interactive environment

Archi-Me (www.archi-me.com) is a new service that enables 3D designers to fully test designs before any construction starts.

Aimed at designers, architects, planners and stakeholders, the new service is the brainchild of Nick Palfrey, one of the Times Online Essence of the Entrepreneur winners this year through his UK company MOOFU.

The service hopes to save time and money by identifying problems early on in the design process without having to rebuild 3D designs from scratch to make them fully interactive. Archi-Me can take any CAD model and create a fully interactive 3D environment that can be explored much like a 3D game using avatars that can interact. See the website for more information.

E The Archi-Me service will help 3D designers to save money, especially when working on architectural visualisations

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Studio Access

Hydrophobia

In a dark corner of industrial Manchester, Jon Denton speaks to the water-obsessed creators of *Hydrophobia*

Dark Energy is an offshoot of Blade Interactive, which made its name on a successful series of snooker sims and is now ready to create a fully fledged adventure

www.darkenergydigital.com

Project: *Hydrophobia*
Description An episodically delivered action game for the Xbox 360 set on a sinking ship. Players must negotiate not only a terrorist uprising, but also the incredibly detailed and dangerous water that fills every inch of the environments, which is setting the standard for H2O in videogames
Country UK
Publisher Dark Energy
Software used 3ds Max, ZBrush, Photoshop

Key people

Gary Switzer
Lead artist

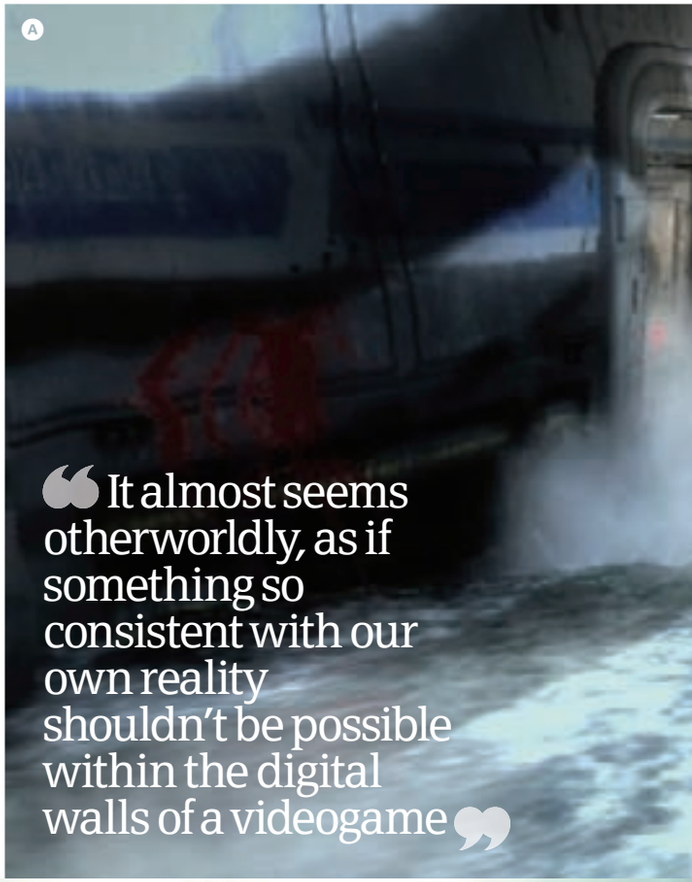
Huw Lloyd
R&D director

John Ogden
Lead tech programmer

In the rapidly evolving world of videogame art, studios battle it out to achieve greatness in very specific areas. Epic's latest iteration of *Unreal 3* is leading the way in its lighting tech, for example, while Avalanche's proprietary engine allows its forthcoming *Just Cause 2* to feature the largest open-scale environments ever imagined on a games console. Just under the radar, though, there's a small British outlet tucked away in an inconspicuous part of Manchester, determined to show up the rest of the world by grabbing hold of one of gaming's last Holy Grails – water.

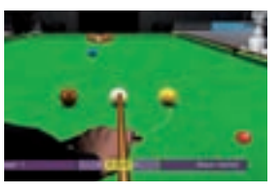
Yes, the team at Dark Energy have been hard at work on the near-future, aquatic thriller, *Hydrophobia,* for some time. It only takes a few seconds inside the watery world to see just how much work has gone into creating genuinely believable H2O. The way the water interacts with the environment seems almost otherworldly, as if something so consistent with our own reality shouldn't be possible within the digital walls of a videogame. But even with such unusual tech on display, it shouldn't come as a great surprise that *Hydrophobia*'s genesis was very similar to almost anything else you could care to mention, as Gary Switzer, lead artist at Dark Energy, is happy to explain.

"Our staple tools are 3ds Max, Photoshop and ZBrush" Switzer tells us. "We start by concept modelling everything in 3ds Max, so we can get a rough idea of size, scale and look, the type of items that will populate a room and so on. These are then exported and dropped into our bespoke InfiniteWorlds editor, where we will build a basic room


A
"It almost seems otherworldly, as if something so consistent with our own reality shouldn't be possible within the digital walls of a videogame"

Portfolio highlights

A summary of games developed by Blade Interactive in recent years



2009 *WSC Real 2009: World Championship Snooker,* Xbox 360
2005 *The Hustle: Detroit Streets* PSP
2004 *World Championship Pool 2004,* Xbox

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outline and fill it with the assets."

It's this bespoke editor that has the sharper corners of the development community talking, as Dark Energy's InfiniteWorlds will be available as middleware for anyone willing to license it. The speed with which artists can build finished environments Dark Energy hopes will prove very attractive to other studios.

"InfiniteWorlds is directly connected to a central data server that outputs everybody's changes instantly to the [Xbox] 360 dev kits on our desks," Switzer goes on to explain. "In a short space of time we can populate a room, light it, put the effects in and have something the player can fully play around in and interact with. After the design guys finalise positions and so on, we'll go back and produce finished models of the white box assets. The system allows us to have completed levels from scratch within a few days – sometimes less."

Even though the prospect of rapid design turnaround will be appealing to many, it's not the real reason to invest in InfiniteWorlds, either as an artist or a gamer. It's no coincidence that Dark Energy's first game is entirely constructed around this central conceit. When asked about the techniques used to render such incredibly lifelike water, R&D director Huw Lloyd is only too happy to fill us in.

"The real key to this is getting the water moving right, from the bulk flow down to the ripples on the surface. It's all done with physical simulation. We don't use animating textures for the ripples, for example, so you don't see any looping.

Doing the fluid dynamics calculations on a videogames console is the big thing that we have cracked – as well as getting it fast enough, the real problem to overcome is getting it stable. Anyone who has tried to write any fluid simulation code will know exactly how difficult this is. There are a number of key innovations that enable us to do this, but obviously we aren't able to say too much about what they are.

The end result is a simulation that looks, feels and behaves like water. It flows from one area to another, objects get carried with the flow and it dynamically generates spray, splashes and ripples from the

A You can see how the concept art has translated to water that not only moves correctly, but is lit in a convincing fashion. Getting the reflection and refraction of light proved one of the toughest challenges for the team

B You'll find innovative ways of negotiating the terrain and getting the better of your enemies

C The game's enemies aren't particularly inspiring to look at, but show suitable volumes of menace

D It's an unfortunate fear to have on board a floating city targeted by terrorists, really...

E The action takes place on a city-sized ship called The Queen of the World

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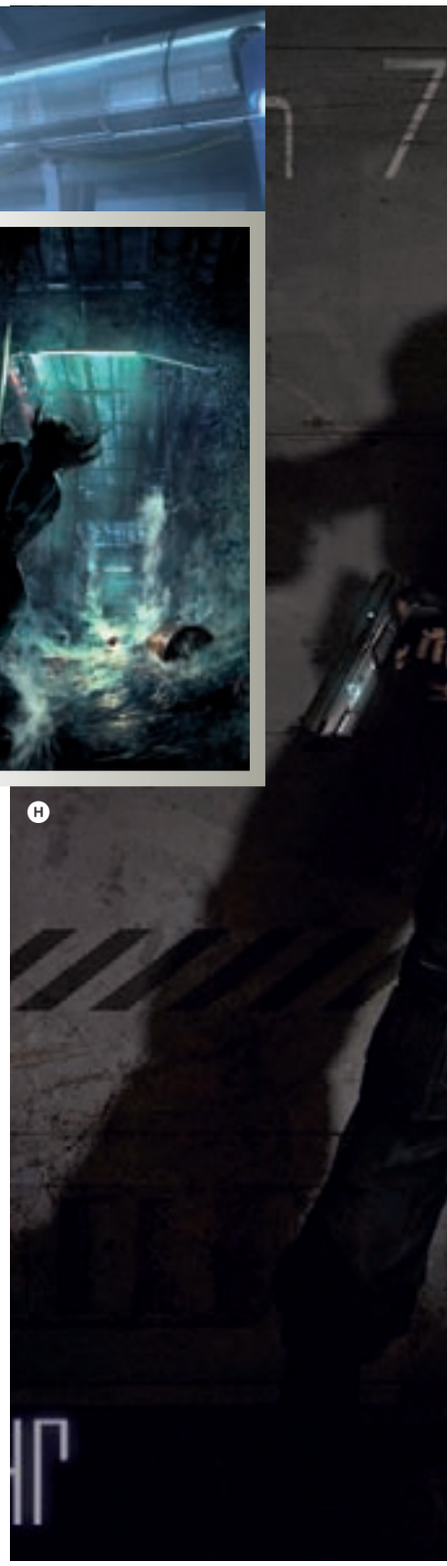
> Lighting setups and soft shadowing systems are almost as important as the environments themselves

F

G



H

fundamental physics calculations."

All well and good, but how do these calculations and simulations actually translate into the game world? With modern, mainstream gaming, lighting setups and soft shadowing systems are almost as important as the environments themselves. With something as unpredictable as physically calculated water, then, it should be no surprise that John Ogden, lead tech programmer on the project, has a considerable amount to say on the matter.

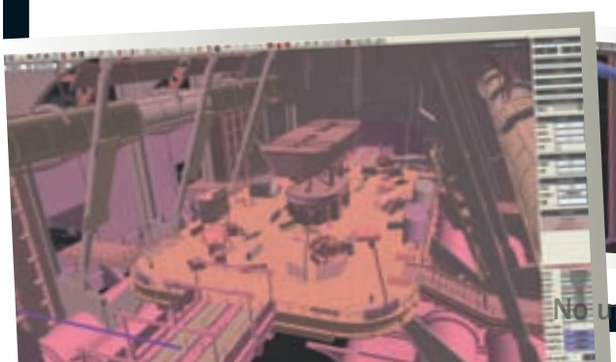
"The game uses a two-step deferred shading process," he begins. "First of all, certain properties (surface normal, surface albedo, specular strength, specular power, etc) from each visible model in the scene are rendered to a set of textures. These textures are collectively called the G-Buffer. Second of all, models representing each light (eg, spheres for an Omni/Point light) are rendered into the scene. For each pixel that is rendered, the pixel shader pulls the corresponding surface properties from the G-Buffer textures and uses them in calculating the light contribution from that light.

The primary advantage of using deferred shading is that the illumination from a light is only calculated for those scene pixels that the light actually affects. This, when compared to a traditional forward shading engine, means the GPU cost of each light is considerably less. Cheaper lights mean more lights and more sophisticated lighting.

Lights can have a varying set of abilities. They can be made to calculate per-pixel diffuse contribution, per-pixel specular contribution, a simple bounce approximation, shadowing, act as a caustic source and act as a source of underwater God rays. Shadowing is based on Variance Shadow maps, a fairly new technique for achieving soft and robust shadowing. All shadows are omnidirectional, but this is not achieved by using Cube maps, but rather the more unusual Dual Paraboloid maps.

All this lighting can be applied to the real star of the game – the water. Rendering the water is a multi-stage process. First of all, Reflection and Refraction maps are rendered, once more using deferred shading. These are used along with the output from the various levels of the fluid simulations to render the water surface using a Fresnel model for reflection and refraction. This information is written to the radiance channel of the G-Buffer ready to be combined with the main lighting later. Once the G-Buffer has the scene and the water rendered into it, each light is applied in turn and accumulated into the lit scene's buffer. This means that the water is being treated just like any other scene object and gets the full benefit of the sophisticated per-pixel real-time lighting."

No expense spared then. So, with water very much



F The blue reflections add an ominous ambience to proceedings

G This perfectly sums up the game's ethos – placing the water as the key focal point, even more so than the lead character, whose face is completely obscured

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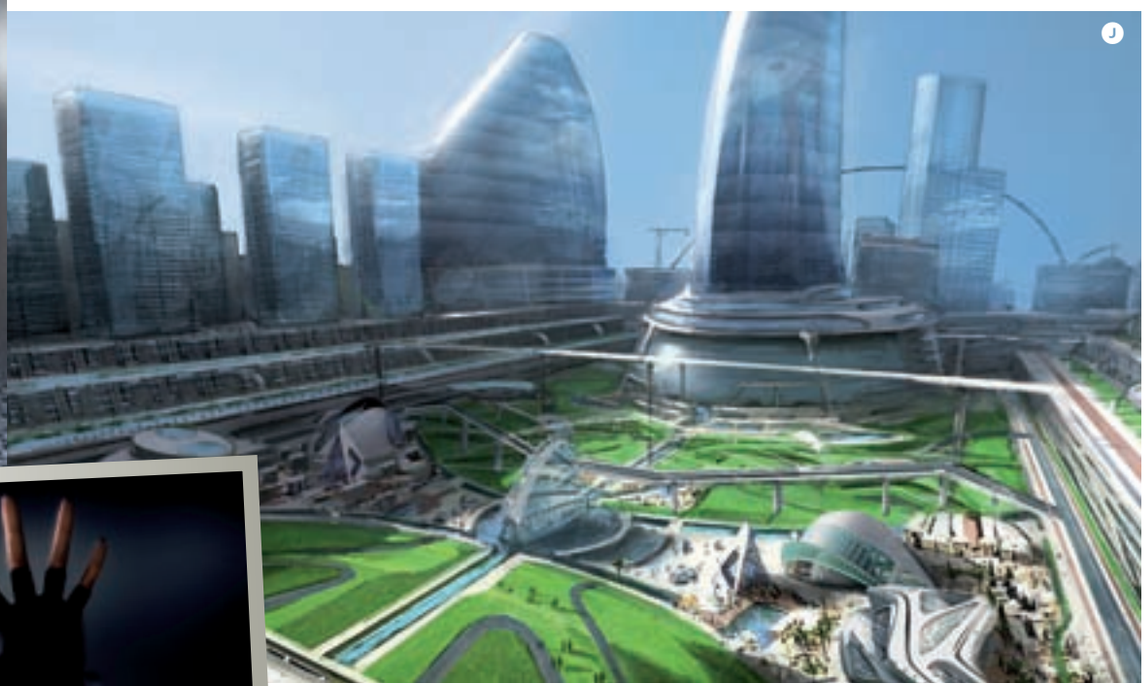
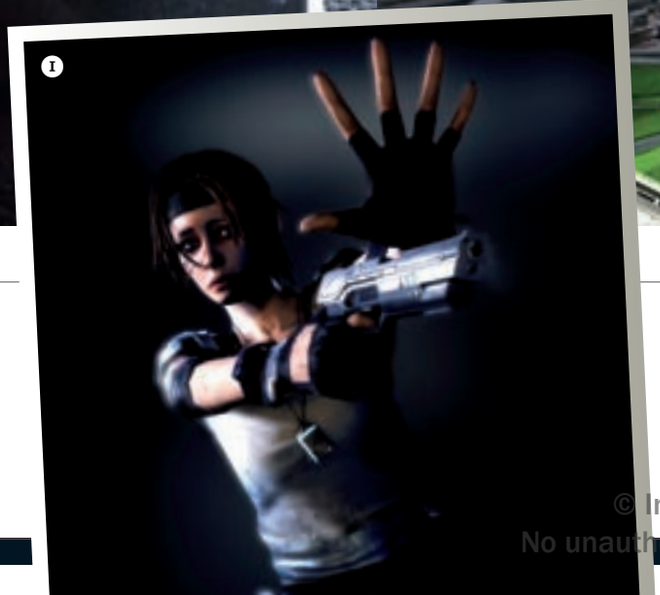
in place and a level builder that can turn around environments in days rather than months, this has freed up Dark Energy to concentrate on creating a look and style to its game to try and separate it from the pack. Easier said than done, of course, as Switzer agrees: "Initially, the toughest task was trying to convey to the player that while they were on a ship, they were also part of a giant floating city. In episode one, we're mainly in the lower decks of the Queen of the World with no connection to the sea outside, so it was important that the player had subtle reminders of where they were, while maintaining the balance between ship and city.

"With *Hydrophobia* being set in the near future, we were also very careful to balance the tech level of the environments – so while we've included gadgets such as flexible digital display screens, we've been very careful not to take things too far. It's very important to keep the player grounded in reality, so each environment will have something that makes the player think, 'yeah I recognise where that's come from,' and then we give it a little twist to update it a little. And because the Queen of the World has been in service for ten years by the time we join the action, we also had to balance the feel that you were in an environment that has been lived and worked in for a decade, without taking it too far and looking like the whole place was in a state of decay. The texture detail level in many areas is really quite detailed, and the end result really shows the time and effort that has been put in."

It almost sounds like *BioShock* in reverse. Certainly the idea of a richly detailed submerged city has echoes of Rapture and its gloriously detailed underwater civilisation, and that's by no means a bad comparison. Still, Switzer is keen to reinforce the originality of his team. "From the outset, we made a conscious effort not to be influenced by other games, as we wanted to create a unique look that the player hadn't seen before in a game. Our main influences have been taken from real life – we've looked at hundreds of photos of ship interiors, for example – so we've picked up on details such as how the ceilings are constructed, where the wiring shows and doesn't show, what materials are used on the floors and walls, and so on."

Nevertheless, it's not the wiring on the walls or the cracks in the ceiling that will attract players' eyes when knee-deep in *Hydrophobia*'s murky depths. Seeing and feeling the force of the water as it creates chaos throughout the game world feels revolutionary for anyone who has seen 3D gaming grow up in the last decade. In an industry where faceless corporations dominate the shop shelves and technological advancements themselves, it's heartening to see a small British team doing such great work, powered by technical skill and ambition. And if InfiniteWorlds doesn't make it into most major game releases after *Hydrophobia*, we'll eat our sodden, water-soaked hats.





H The concept work for the protagonist Kate has made it into the final product pretty much intact

I Kate Wilson is an engineer on the ship, who has to tackle her demons, her surroundings as well as her enemies

J It's not all doom and gloom. Although most of the game is set in the bowels of the Queen of the World ship, there are outdoor environments that allow the artists to flex their more colourful muscles

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Industry insider

Daniel Moreno

3D character animator

Each issue, **3D Artist** finds out how people in the 3D industry got their jobs and what you need to know to get a foot in the door

About the insider

Job 3D character animator/ effects animator

Education Bachelor degree in Design at PUC-Rio. Courses at the Gnomon School of Visual Effects

Company website
www.laruccia.com.br

Personal website
www.danmoreno.com

Biography Born in Rio de Janeiro, character animator Daniel Moreno graduated in Design and studied at Gnomon in LA. He worked at many production houses doing TV commercials, feature films and music videos

Daniel de Albuquerque Moreno was born in Rio de Janeiro and developed an interest in animation from an early age. He used to play a lot of games and watch a lot of cartoons and animated films. Between 1999 and 2000 he went to Los Angeles, CA to study at the Gnomon School of Visual Effects. He took several classes there, including Character Animation, Character Construction and so on. Back in Rio de Janeiro, he worked at Parafernália/Artefato Digital for two years, creating TV commercials and the opening credits to *O Caminho das Nuvens*. In 2004 he joined the team at Black Maria Films and moved to Sao Paulo to work on TV commercials and music videos. After that it was time to get his hands dirty in the world of feature film animation. This was a new Brazilian 3D film called *O Grilo Feliz e os Insetos Gigantes*, or *The Happy Cricket and the Giant Insects*. The movie premiered in January 2009. After the feature film work ended, Moreno joined the team at Laruccia Animation Studios, where he creates character animation, effects and scripts for television commercials, music videos and TV series.

3D Artist: *What kind of course did you do at university, or training did you do?*
Daniel Moreno: I graduated in Design in 2004 at PUC-Rio (Bachelor's degree) but before that I took about ten courses at Gnomon School of Visual Effects (2000). Along with those, I read several books on the matter and studied and practised constantly.

3DA: *For today's generation of students, what is the kind of educational grounding they should be looking to undertake to get a first job as a character animator, or is the entry level a less specific role?*
DM: I think courses are a great start, and you should take one if you have difficulty walking your own way. Courses are really a great short cut. I can't really tell you a lot about university training, as the only one I had was in Design (not Animation). Anyway, most of the learning is done by you alone. There is no easy way, no simpler way than getting your hands dirty. You have to practise a lot until you have breakthroughs in animation.

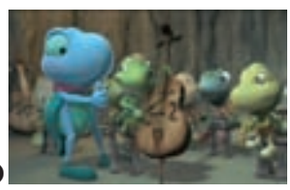
3DA: *What is your current or most recent role and how did you get it?*
DM: Right now I am a character animator at Laruccia Animation Studios, but I also like the effects and scripting part so I help on these areas, too. The way I got in Laruccia was the same way as everybody else's – I sent in my reel and got an interview.

3DA: *Is there much of a culture or professional working practice difference between working on something like a full 3D animation film and on television commercials?*
DM: There sure is a lot of difference between 3D animation film and TV commercials. In TV commercials there is never enough time to finish the job the way you want it. Things are much faster and the processes must be done very quickly. Feature film work has a much nicer atmosphere, there's

Portfolio highlights

These are some of the projects that Moreno has lent his 3D skills to

2009 *The Happy Cricket and the Giant Insects*, 3D animation feature film
2004 *Macuna*, music video
2002 *O Caminho das Nuvens*



A Courtesy of Start Desenhos Animados
B Courtesy of Start Desenhos Animados
C Courtesy of Start Desenhos Animados

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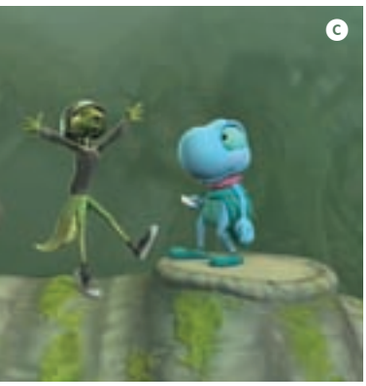

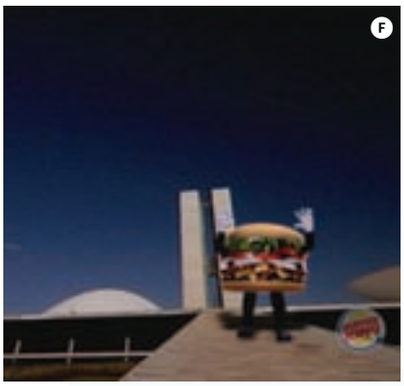

much more time to do each process, therefore it has a higher quality of animation. There is the animatic, which gets broken down in pieces for scene planning. Then the animation begins, and then it is reviewed for approval. The acting of characters is carefully watched by the directors. They usually go through your animation frame by frame (so you should look at your animation this way, too).

3DA: *What software packages and tools have you mainly used for feature animation and general character animation?*
DM: For character animation, I use Autodesk Maya for both feature film and TV commercials. I find it very flexible and customisable. The tools it provides are all that is needed for animation.

3DA: *Do you think there is a shortage of skilled digital artists doing animation and did you find it difficult getting into the industry?*
DM: There is a shortage of skilled digital artists, especially in animation. In Brazil there's even less people doing it! It is probably easier to get into the animation industry here than it must be in Europe, for example. Also, people usually take a six-month course and want to get their first job really soon. It does not happen this way. You have to mature your knowledge and practise a lot before you land a job in a studio. And when you are mature enough to deal with production issues, it is probably the time to apply.

3DA: *What are the key skills needed by a character animator?*
DM: I believe every animator must be a good observer. You need to study shapes and movement constantly. The trajectory of the hands, the formed arcs, acceleration, deceleration... it's a long list. And every day you animate based on observations and references. There is also a lot of physics, balance and weight (action and reaction). You must have a good understanding in several areas.

3DA: *If there was one feature missing from current software apps that you'd like to see implemented to help the animator, what would it be?*
DM: Well, I would like to see interactive hands and foot collision with the ground and obstacles. Something difficult to do is interaction with both other characters and objects. It would be much faster if the geometry could detect and fit accordingly.

3DA: *Do you have a personal philosophy or approach to life and try to bring that to your work?*
DM: I believe you should not rush things. Everything comes at its time. Both knowledge and quality of work improves taking a good deal of time in each animation. So do not rush. Take your time and experiment with it.

3DA: *Professionally, what's the most satisfying project you've worked on and why?*
DM: I believe it was *The Happy Cricket 2* movie. I spent a lot of time animating it and improved my animation a lot by experimenting and seeing what works best. There is nothing better than practice. It was a really great school for me. We were on schedule every month and it was really fun to do.

3DA: *What would be your dream project to work on?*
DM: My dream project would be working on a bigger feature film. The bigger studios are doing excellent jobs technically and artistically, so it makes me want to be part of their great movies. They are really getting the quality sky-high. And it would be great to have your name on these great productions.

D Courtesy of Start Desenhos Animados

E Courtesy of Lightbox Studios

F Courtesy of Black Maria Films (Brazil)

G Courtesy of Start Desenhos Animados

H Courtesy of Laruccia Animation Studios

I Courtesy of Start Desenhos Animados

> "You have to mature your knowledge and practise a lot before you land a job in a studio"

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+ The best course and freshest talent from universities around the globe...

Portsmouth University

BSc (Hons) Computer Games Technology

Portsmouth University is one of the top university destinations, situated on the south coast of England. With close links to Southampton and Bournemouth, this is a perfect place to study – particularly if you are a fan of the seaside!

Based in Hampshire, this old naval port is full of history and home to Nelson's flagship HMS Victory. There are plenty of bars and restaurants to keep the social student occupied, while Portsmouth Football Club will appeal to the sports fans.

Portsmouth University has a great reputation for up-to-date industry-led courses and the BSc (Hons) Computer Games Technology course is no exception. The syllabus includes training on game design, three-dimensional graphics, animation, game programming, virtual reality and project planning.

The course is also designed to give students options to specialise in a specific area. The first specialist area is game graphics, in which students discover how to use the industry-standard software tools and develop their character building and animation skills. The second area of specialism is game programming, where students learn the programming languages required in the industry as well as console development.

On top of their specialism, students also undergo training in game design and project management – the latter a skill that the industry is particularly crying out for. Portsmouth University prides itself for its fantastic relationships within the games industry, which means the course remains relevant and up to date. These links also mean there are lots of opportunities for students to gain experience within the videogames industry, too.

The BSc (Hons) Computer Games Technology course is a big draw for both UK-based and international students and offers exciting opportunities for students all over the world. The university has been listed as the fifth most popular destination for EU students and tenth most popular for non-EU students.

The university is split into two campuses (Guildhall and Langstone) and students can enjoy a wealth of facilities, including the University Library, which received an £11 million extension three years ago.

There are plenty of sports clubs, music events and recreational groups to keep the most active student amused, making Portsmouth a great place to both study and live.

For more information on the course and Portsmouth University, head to www.port.ac.uk.

University of Portsmouth

Course details

Tel +44 (0)1642 342639

Web www.port.ac.uk

Duration Three to four years

Fees From £3,070 a year

ENTRY REQUIREMENTS

240 points to include two A-levels or one Double Award A-level or equivalent. A-level Computing is preferred

> "The course enables you to develop skills that are sought-after in the games industry, making this a really valuable course"
>
> **Rory Butchart** 2009

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Ⓐ

Ⓑ

Ⓒ

Ⓐ Industrial Warehouse
» **Rory Butchart**
Time taken: Six hours approximately
3ds Max
"This is one of my first projects, and it certainly won't be my last!"

Ⓑ Matlok the Merciless
» **Sam Merrick**
Time taken: Ten days
3ds Max 2009, ZBrush 3, Photoshop CS2
"The figure was developed alongside the Xen character, based on human characteristics, but modified to reflect more realistic ogre proportions. The model is capable of supporting interactive game technologies."

Ⓒ Xen
» **Sam Merrick**
Time taken: 12 days
3ds Max 2009, ZBrush 3, Photoshop CS2
"This character model was developed to take account of the anatomical rules associated with the human form and to experiment with different clothing textures. The model is fully animated and capable of supporting interactive game technologies and 3D video features."

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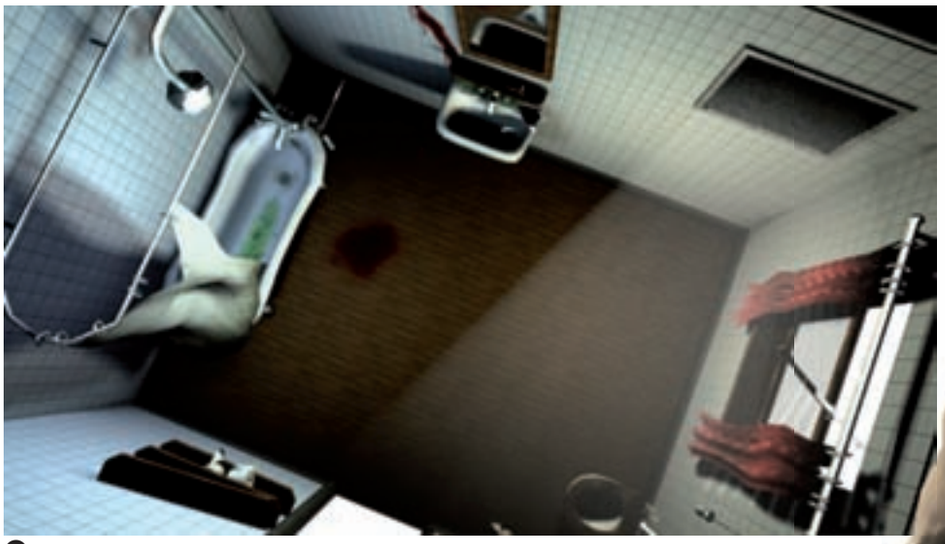

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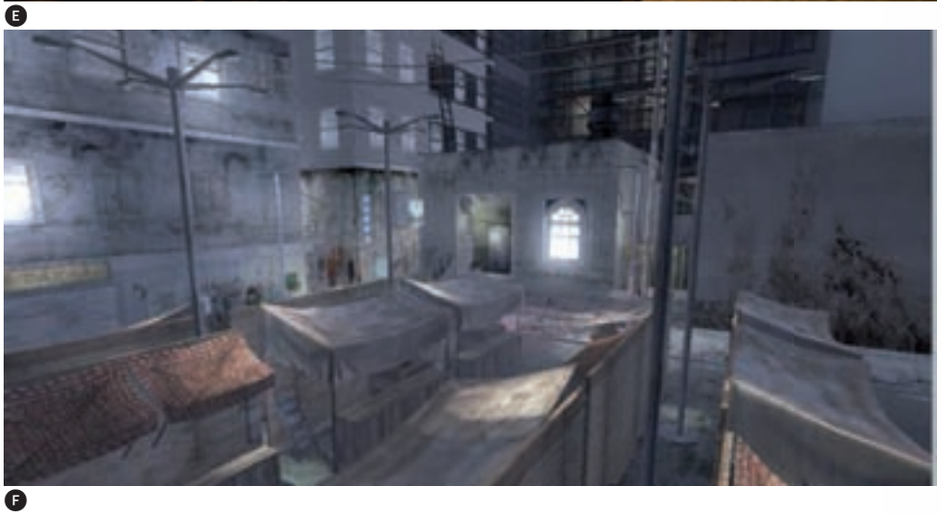

F

G

D Dirty Bathroom
» **Josh Short**
Time taken: About one day
3ds Max and Photoshop
"This image was created as part of the third year's Imaginary Worlds and Architecture unit."

E Los Hornillos Palace Entrance Hall
» **Josh Short**
Time taken: About two weeks for the whole level
3ds Max, Photoshop and Gavin Wade's GET
"This is an in-game screenshot of part of a larger level created to test a game engine for my major project."

F BackAlley
» **Jack Marshall**
Time taken: Six hours (whole level)
EditWorld, 3ds Max, Photoshop
"A multiplayer level called BackAlley for the game *Quake Wars: Enemy Territory* made in EditWorld."

G The Aggressor
» **Nicholas Tenhue**
Time taken: Five days
3ds Max 2009, Photoshop CS3 and ZBrush 3.1
"Creating this real-time character in such a short amount of time was a real test of endurance!"

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H

I

> You get to specialise in either game graphics or game programming, which means you can really focus on the stuff you enjoy and push your skills to the limit
>
> **Tina Matthews** 2009

J

H Prison Level
» **Tina Matthews**
Time taken: 36 hours (over several weeks)
3ds Max, Adobe Photoshop
"This is a rendered image of a level created for a fictitious game based in a prison."

I Game level mock-up inspired by *Half-Life 2*
» **Neil Dansey**
Time taken: Approximately 20 hours (including rough work and rendering)
3ds Max 7
"Concept art coursework for Imaginary Architecture unit."

J Artega GT
» **Nicholas Tenhue**
Time taken: Two weeks
3ds Max 2009 and V-Ray 1.5
"Personal project to create a realistic studio render of a car exterior."

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